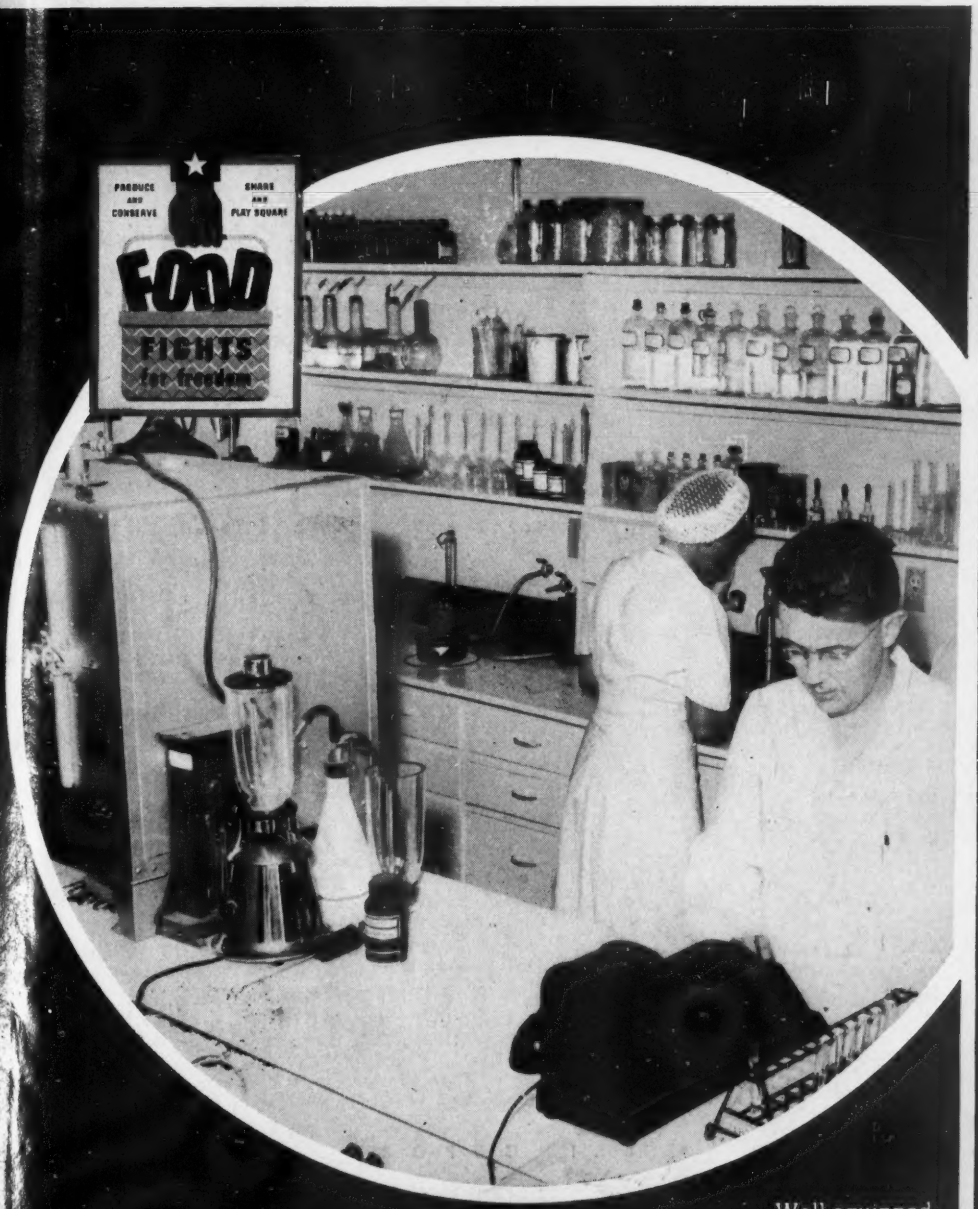
FOOD INDUSTRIES

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION



Well-equipped laboratory in Simplot dehydration plant

NOVEMBER 1943

FROZEN FOODS DIRECTORY

Dehydrator Uses New Technics

Measuring Moisture In Dehydration

Brewer Enriches Byproduct Yeast

Preserving Mullet By Brine Salting

Dehydrating and Freezing Mushrooms

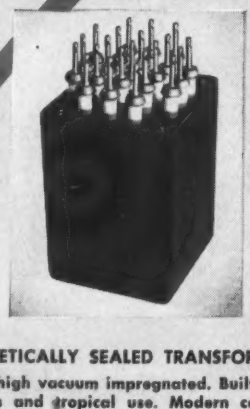
How to Make Dry Whole Milk Keep

McGRAW-HILL PUBLICATION

When will war production End?

Excerpt from "A Special Report on America's Industrial Future" by The Research Institute of America.

"At the end of the twelve-month period (July 1944), large areas of slowing down and actual cessation in war manufacture will be appearing. This will be a critical period for many companies . . . **IT IS THE PERIOD TOWARD WHICH EXECUTIVE THINKING AND PLANNING SHOULD *NOW* BE DIRECTED"**



HERMETICALLY SEALED TRANSFORMERS

Gas filled or high vacuum impregnated. Built to withstand high altitudes and tropical use. Modern case design in standard sizes.

Other products manufactured include:

ELECTRONIC CONTROLS • VACUUM TUBES OF STANDARD AND SPECIAL TYPES • HYDRAULIC SERVOS ELECTROMECHANICAL DEVICES

● Of this you can be sure: Many business and industrial organizations are losing no time in preparing for a head-start in the competitive postwar market. They are planning and designing new ways to make better products, faster and cheaper . . . through the use of Electronics.

For assistance in *your* planning, General Electronics Industries offers the research engineering skill and specialized experience that have met the exacting tests of war with great achievements in the fields of *Electronics, Hydraulics* and *Electromechanics.* And further, General Electronics Industries has the facilities, equipment and personnel to meet your requirements with speed and efficiency.

Write to Engineering Department, General Electronics Industries, 342 West Putnam Avenue, Greenwich, Connecticut.

Army-Navy "E" with Star, awarded to Auto-Ordnance Corporation for continued excellence in production of "Tommy" Guns

GENERAL Electronics INDUSTRIES

Division of Auto-Ordnance Corporation

GREENWICH • STAMFORD • BRIDGEPORT • NEW YORK

NOVEMBER FOOD TECHNOLOGY

CEREAL PRODUCTS
Vitamin Increase in Sprouting of Grains 147
The Cereal Amylases 147

QUALITY CONTROL
Microscopic Method Used in Study of Ice Cream 147

DAIRY PRODUCTS
Homogenized Milk Tests 147
Cheese Making 147
Removal of Oxidizing Factors Makes Whole Dry Milk Keep 76

BACTERIOLOGY
Vegetable Peptones as Culture Media 148

DEHYDRATION
Dehydrator Uses New Technics 59
Determining Moisture in Dehydrated Vegetables 64

FISH PRODUCTS
Brine-Salted Mullet Has Unrealized Possibilities 70

PICKLING
Use of Starters in Genuine Dill Pickles .. 148

PACKAGING MATERIALS
Paperboard Antioxidant 149

MISCELLANEOUS
Vitamin-Rich Food Made From Byproduct Yeast 66
Methods for Quick Freezing and Dehydrating Mushrooms 74

THE COVER

Described by a well-known food technologist as much the best equipped of any dehydration plant laboratory in the West, the Simplot laboratory shown on the cover is one of the reasons for the success of Jack Simplot's dehydration operations. Chemist Ray Dunlap is shown in the picture. For complete details on the Simplot plant, see the article on page 59.

EVERY MONTH

Editorial 55
Talk of the Industry 56
Automotive 72
New Packages and Products 100
The Food Industry News 105
Men, Jobs and Companies 125
Food Equipment News 129
Just Off the Press 135
Books 136
Letters to the Editor 137
Patents 138
Food Technology—Abstracts 147
Questions and Answers 150
Formulas 153

FOOD INDUSTRIES

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VOL. 15, No. 11 — NOVEMBER, 1943

FROZEN FOODS DIRECTORY
1943 Edition 79
List of companies packing frozen foods, with information on products frozen, brands, containers, freezing systems and size of pack

DEHYDRATED FOODS
Dehydrator Uses New Technics ..... *By L. V. Burton* 59
Complete with plant layout, flowsheet and pictures, this article explains the operations of the big, modern Simplot dehydration plant

Determining Moisture in Dehydrated Vegetables
By F. A. Lee and J. C. Moyer 64
Here is a report which evaluates several methods for rapidly estimating the amount of moisture in vegetables after dehydration

PRODUCTION
Vitamin-Rich Food Made From Byproduct Yeast
By L. V. Burton 66
Yeast that has been used in brewing is put through a chemical and bacteriological process to debitter it and make it rich in vitamin B

Brine-Salted Mullet Has Unrealized Possibilities
By Charles F. Lee and Leo Young 70
More general utilization of a valuable food resource of our coastal waters is urged. Preservation by brine-salting is discussed

MANAGEMENT
A Well-Engineered Trucking Operation 72
How a Southern food distributor systematically determined the type of equipment which best meets the requirements of a long haul

QUALITY CONTROL
Methods for Quick Freezing and Dehydrating Mushrooms
By H. J. Brunell, W. B. Esselen, Jr., and F. P. Griffiths 74
Mushrooms may be preserved by quick freezing or by dehydration. Both methods yield a flavorful product with the vitamins retained

Removal of Oxidizing Factors Makes Dry Whole Milk Keep
By C. D. Dahle and D. V. Josephson 76
Whole milk powder has excellent keeping qualities when the pro-oxidants are removed. This improves its postwar possibilities

★ ★ ★ CHANGE OF ADDRESS ★ ★ ★

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York 18, N. Y.
Director of Circulation:

Please change my address on "Food Industries"

From .....

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To .....

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Signed .....

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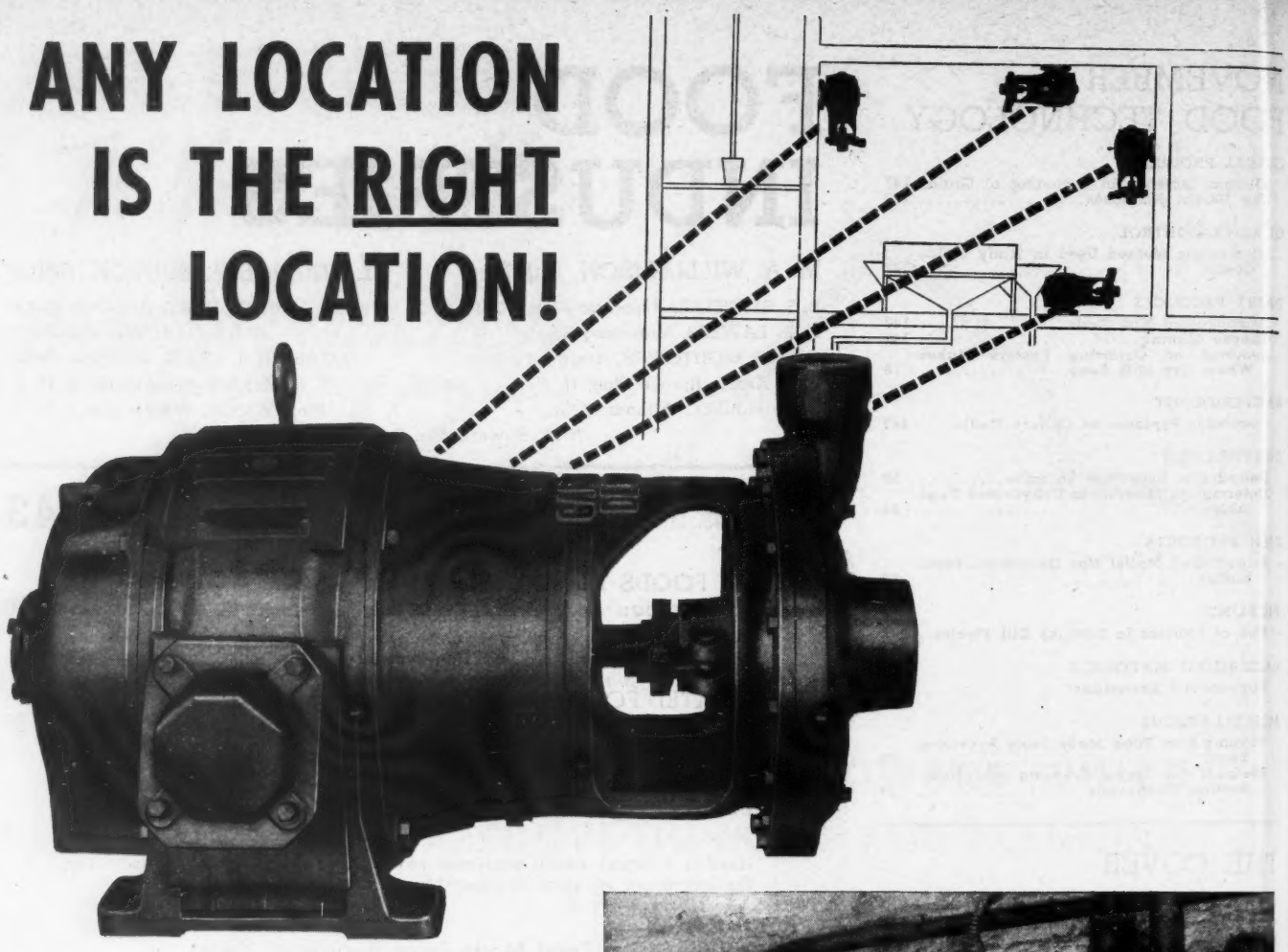
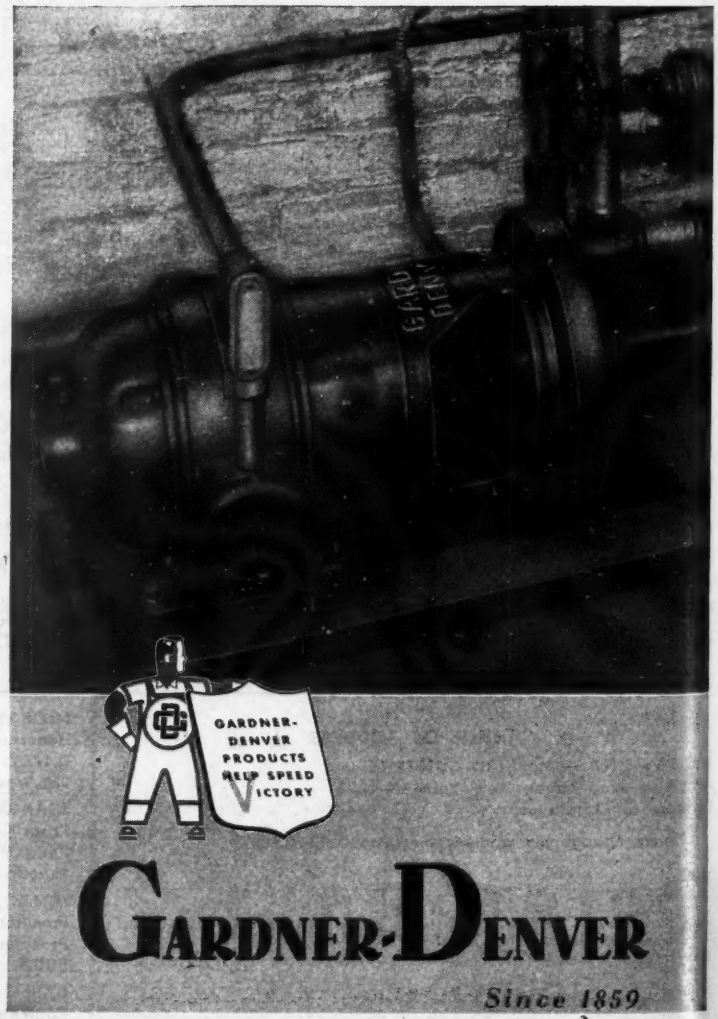
ANY LOCATION IS THE RIGHT LOCATION!



Here is a pump that can be installed in any position on floor, wall or ceiling—either horizontally or vertically: the Gardner-Denver Close-Coupled Centrifugal. Pump and motor form a complete, compact pumping unit ready for installation. For convenience in fitting installation requirements, discharge nozzle can be turned to any one of 8 different positions.

Like all Gardner-Denver Centrifugal Pumps, this Close-Coupled unit is designed with proved hydraulic and mechanical advantages for truly modern pumping performance. For example, water passages and impeller blades are carefully proportioned and thoroughly tested for efficient operation.

For safe operation, splash-proof and explosion-proof motors can be furnished where necessary. Gardner-Denver Close-Coupled Centrifugal Pumps are built in a full capacity range from 30 to 1200 G.P.M. For complete specifications, write Gardner-Denver Company, Quincy, Illinois.

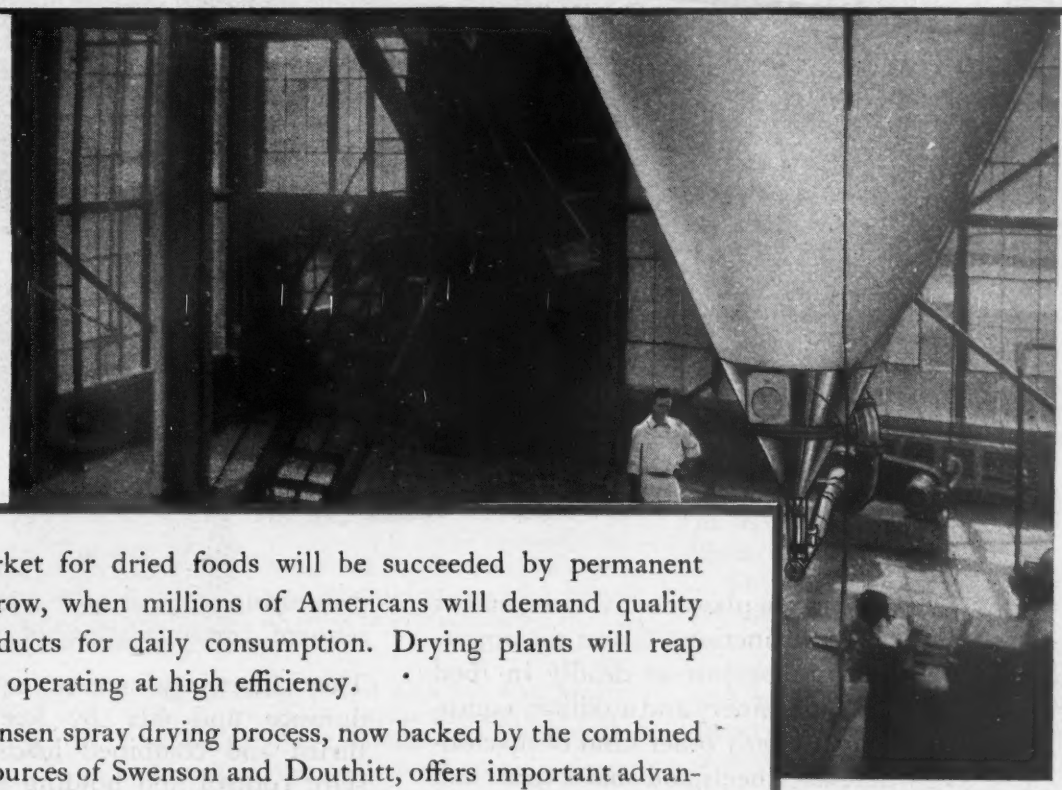


GARDNER-DENVER

Since 1859

FOOD INDUSTRIES is published monthly. Price 35c per copy. Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Food Industries, 330 West 42nd St., New York, N. Y. Subscription rates: United States and Possessions, Mexico, Central and South American countries, $3 a year, $4 for two years, $5 for three years. Canada, $3.50 a year; $5 for two years; $6 for three years (payable in Canadian or U. S. Funds). Great Britain and British possessions, 30 shillings for one year, 60 shillings for three years. All other countries, $5 a year, $8 for two years, $10 for three years. Entered as second-class matter, Aug. 17, 1936, at Post Office, Albany, N. Y., under act of March 3, 1879.

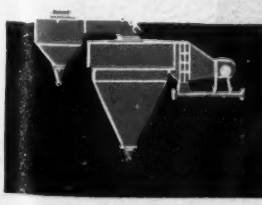
THE GRAY-JENSEN PROCESS *points the way to* BIGGER PROFITS!



Today's market for dried foods will be succeeded by permanent markets tomorrow, when millions of Americans will demand quality dried food products for daily consumption. Drying plants will reap rich rewards by operating at high efficiency.

The Gray-Jensen spray drying process, now backed by the combined engineering resources of Swenson and Douthitt, offers important advantages in the drying of all foods that can be reduced to liquid and handled with pumps. Gray-Jensen plants produce food powders that retain full nutritive values, as well as natural flavor and color.

Because of the efficiency engineered into these plants, great economies are gained. Operating temperatures are low, heated air is completely utilized, and solids are 100% recovered. It will pay you to get full details concerning this equipment.

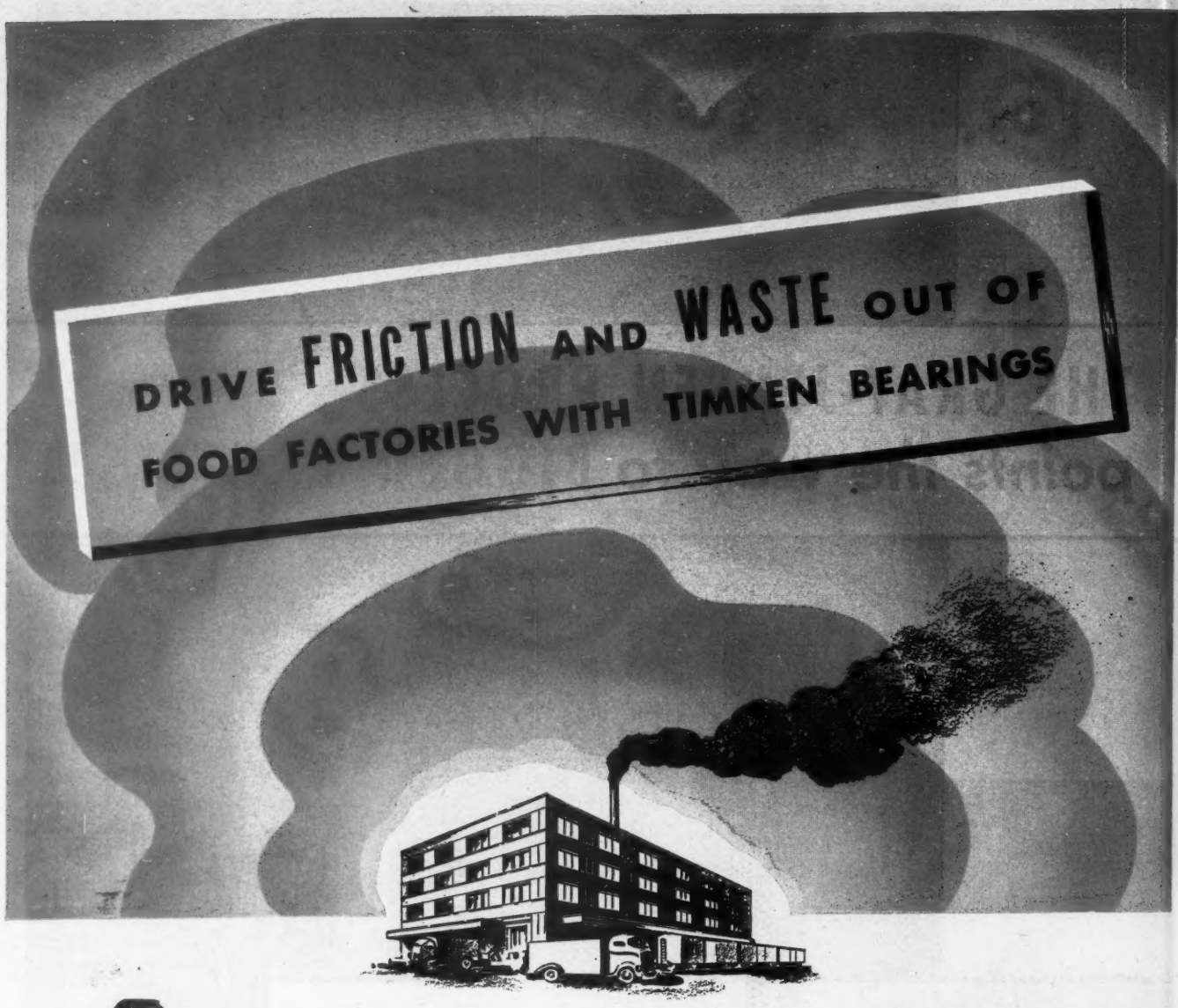


DOUTHITT GRAY-JENSEN

SWENSON EVAPORATOR CO. DIVISION of WHITING CORPORATION

221 No. La Salle St., Chicago 1, Ill., U. S. A.

DRIVE FRICTION AND WASTE OUT OF FOOD FACTORIES WITH TIMKEN BEARINGS



Friction plays no favorites, makes no distinctions. Given the opportunity, it can be just as deadly in food processing machinery and auxiliary equipment as it is in any other kind of machinery wherever wheels and shafts turn; and wherever friction holds sway, waste follows. Waste of power; waste of time; waste of lubricant; waste of material.

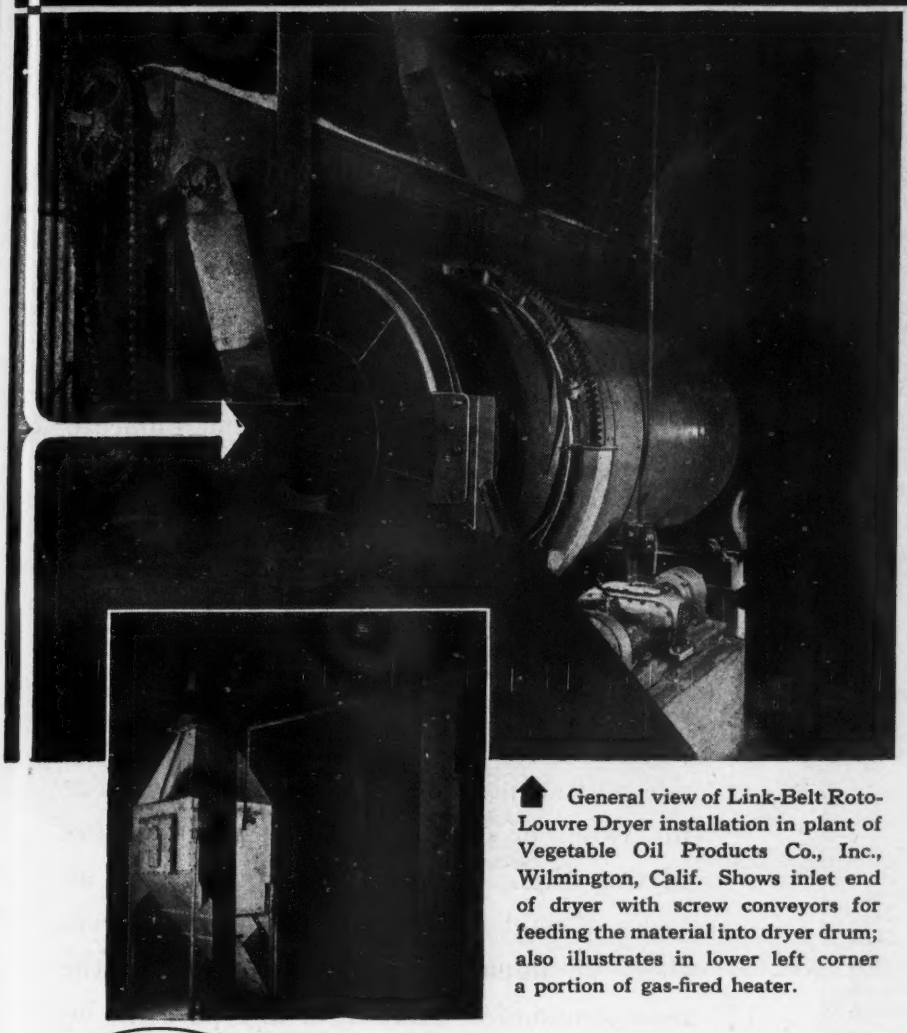
Timken Tapered Roller Bearings stop this waste by eliminating friction and wear; reducing involuntary shutdowns; preventing leakage of lubricant and consequent contamination of the product.

They likewise increase equipment endurance and life by keeping radial, thrust and combined loads under constant control and holding moving parts in permanent alignment. Before buying machinery of any kind ask if it is Timken Bearing Equipped. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN
TAPERED ROLLER BEARINGS

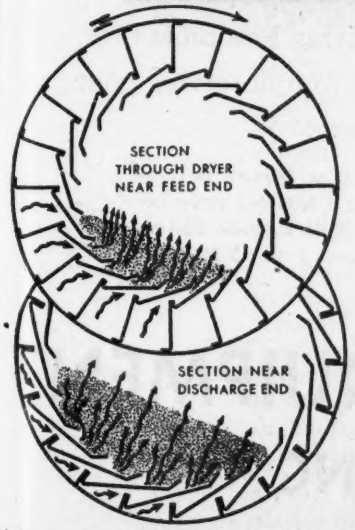
Competition will be tough after Victory. Get ready for it now; give your equipment maximum performance by redesigning to use more Timken Bearings.

How a Vegetable Oil Producer Dehydrates Oil-containing Products



General view of Link-Belt Roto-Louvre Dryer installation in plant of Vegetable Oil Products Co., Inc., Wilmington, Calif. Shows inlet end of dryer with screw conveyors for feeding the material into dryer drum; also illustrates in lower left corner a portion of gas-fired heater.

Discharge end of Link-Belt Roto-Louvre Dryer. The dried products discharge to a short horizontal screw conveyor below floor level, feeding to the steel-encased bucket elevator seen at right. Bucket elevator discharges to screw conveyors which carry the material to a battery of oil expellers.



A large volume of dry hot air easily penetrates the relatively thin bed of material near the feed end of the dryer for maximum heat transfer where greatest evaporation can take place. As the material moves forward the bed becomes thicker and the air passages get smaller so that a reduced volume of heated air will penetrate the bed—thus preventing overheating.

● Copra, mustard seed, apricot kernels, and soy beans number among the oil-containing products being dehydrated at the Wilmington, Calif., plant of Vegetable Oil Products Co., Inc. By removing the excess moisture the following results are realized:

1. The extraction of oil is made easier.
2. A firmer meal of the residue is obtained.

The moisture in copra is reduced from 5.4% to 1.5%. 418 pounds of moisture is evaporated as 10,000 lbs. of the dehydrated product is discharged per hour. Copra is discharged from dryer at 140° F. with an exhaust air temperature of 160°.

The dryer handles between 45 and 50 tons of ground apricot kernels per 24-hour day. The moisture content is reduced from 7.6% to 4.6%. Inlet air temperature of 350° F. is used.

This efficient dryer operates on the convection principle of heat transfer. Materials are protected from over-heating and breakage. There are no "spotty" results—every particle of material is uniformly treated. Book No. 1911 tells how drying problems are solved. Send for it.

9323

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8.
Offices, warehouses and distributors in principal cities.

LINK-BELT
THE SYMBOL OF QUALITY · LINK-BELT COMPANY ·
ROTO-LOUVRE HEAT DRYER

"LIGHTNIN" DOUBLE ACTION

Carbonated Beverages
Tomato Products
Jellies—Jams—Preserves
Lard—Milk—Ice Cream Mix
Milk Drinks—Buttermilk
Bakery Supplies—Soups
Brines—Syrups—Vinegar
Wines—Yeast Products
Flavorings—Fruit Pulp
Extracts—Vegetable Dyes
Mayonnaise and Salad Dressings
Sherbet—Honey—Beer
Distilled Spirits—Meat Sauce
Baby Foods—Vegetable Oils
Vegetable Butters
Mincemeat—Cod Liver Oil

helps to speed up food *Processing*

There are certain places in the food plant where the installation of a "Lightnin" Mixer is, in effect, the equivalent of adding duplicate processing equipment because proper agitation speeds up food processing. If your problem is one of greater production, perhaps a "Lightnin" Mixer is the answer. Mixing Equipment Company's 25 years of experience is yours for the asking.

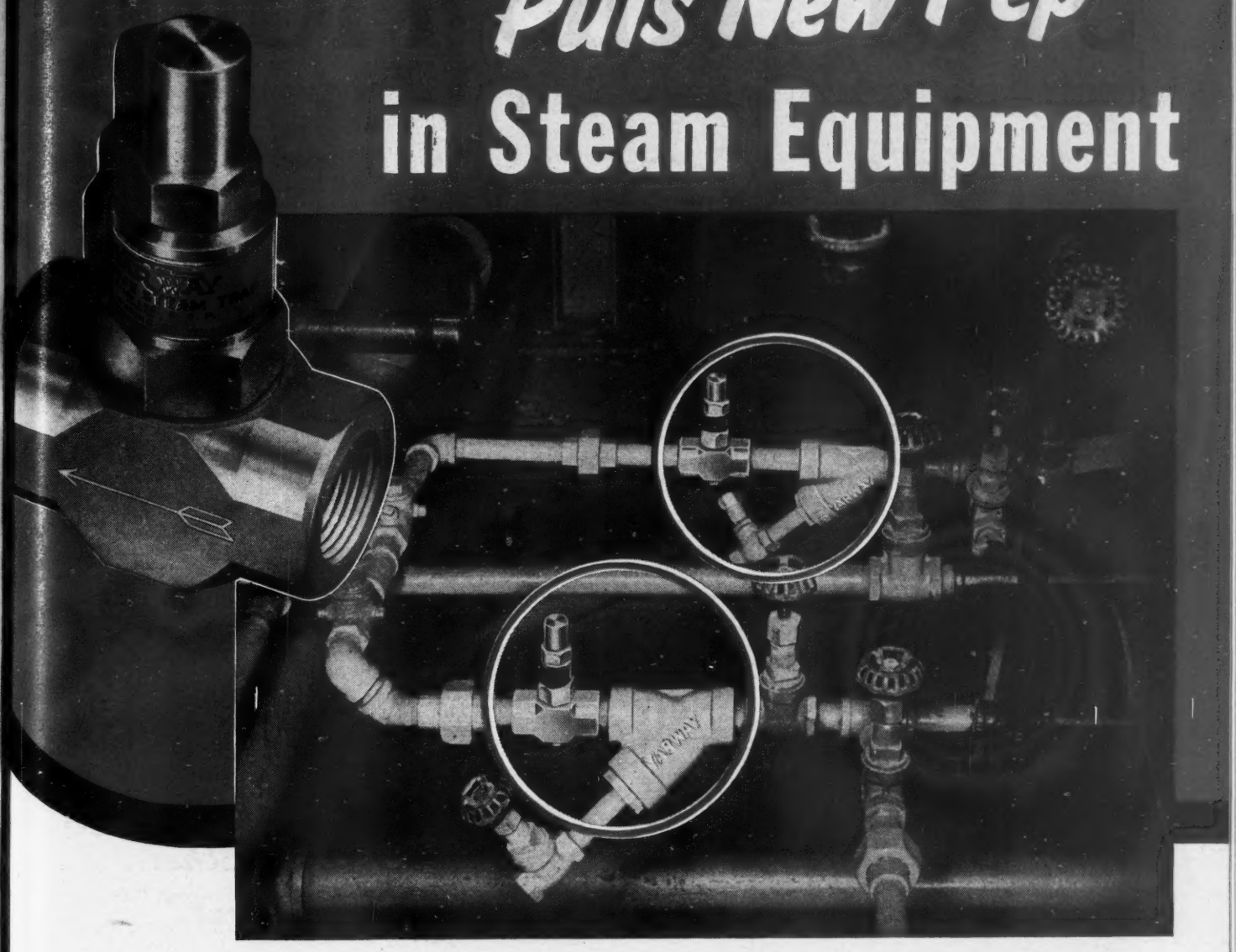
There is a process adapted agitator for every size and shape of tank and every operation; for batch or continuous operation. Because Mixing Equipment Co. products include *all* types of fluid agitators, you can obtain from them an impartial recommendation for the most economical solution of any problem involving fluid agitation. Mixing Equipment Co. engineers will gladly assist you in solving your particular agitation problem.

• Portable Mixers, Geared or Direct Drive—⅛ to 10 H.P. Top Entering Units for pressure or vacuum vessels, ¼ to 50 H.P. Side Entering Units for horizontal use, 1 to 25 H.P.

MIXING EQUIPMENT CO., INC.

1043 GARSON AVE., ROCHESTER 9, N. Y.

"Vitamin Y" Puts New Pep in Steam Equipment



PERHAPS you've never heard of Vitamin Y. For the sake of this message, it stands for Yarway Impulse Steam Traps. But you have heard of Gelatin Products Company of Detroit—world's largest producer of soft, elastic gelatin capsules, and big factor in the production of the health and energy-giving vitamins which hold the center of the stage in public interest today.

And here is the connection. A Yarway representative in this company's territory writes: "A year or so ago they started using Yarway Traps after they had been called to the attention of the Fine Chemical Div. Soon they were using them exclusively in this division and throughout the rest of the factory.

"They like them for their ability to work on any varying pressure, their freedom from air-binding and their compactness. Much of their equipment is small and the piping complicated. Yarways go in especially well.

"In all, they have over a 100 Yarways at work on heaters, stills, reaction kettles, unit heaters, etc.

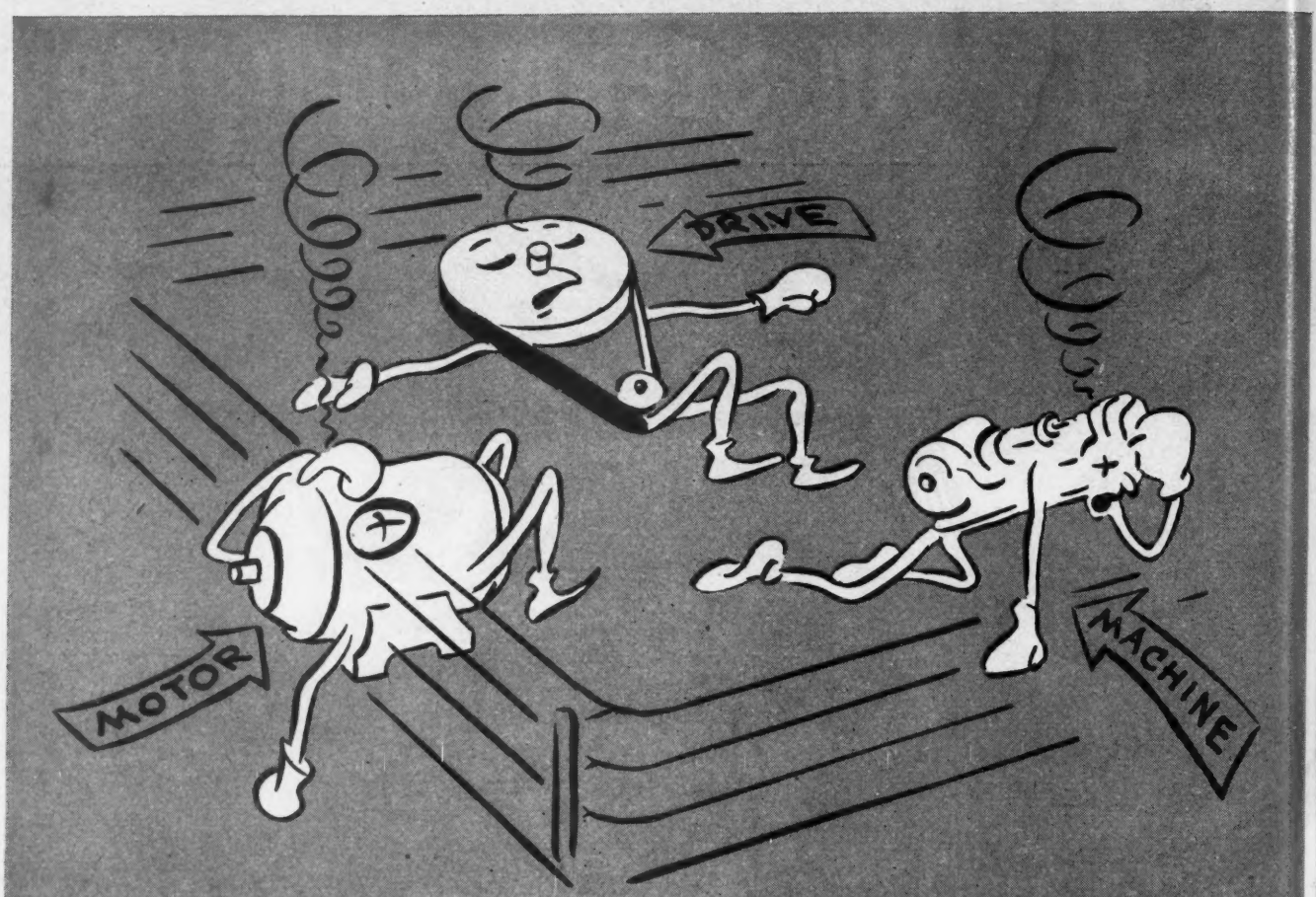
"It would seem to me that we might play up the copy on the vitamin angle—vitamins to increase energy in the human body—Yarways always to increase the energy received from steam, etc., etc. With some thought we could make a catchy ad from this copy."

We think so too, but he could have mentioned that Yarway Impulse Traps usually cost no more to buy, than to repair an ordinary trap. Also that more than 250,000 have been purchased and over 100 convenient Mill Supply Distributors carry them. Why don't you see your supply house or write for Bulletin T-1737.

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY IMPULSE STEAM TRAP

STOP THIS FIGHT!



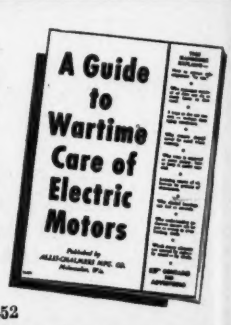
Once Misalignment starts 'em Fighting each other . . . the only Question is: Which will go First?

SPRUNG OR BROKEN shafts, burned-out bearings, overload failure—are cases of motor damage commonly caused by Misalignment. And the damage can occur in drive or driven machine, too. For when these elements are assembled in incorrect geometry, bending, breaking or excessive wear must result. *Something has to "give!"*

Picture above is from Allis-Chalmers' new "Guide to Wartime Care of Electric Motors" . . . which takes a fresh look at Misalignment *and the 8 other main enemies of motor life!*

Over 100,000 copies of this valuable new book are already in use by armed forces and industry. Applies to all makes—contains no advertising. Send for *your* free copy.

ALLIS-CHALMERS, MILWAUKEE 1, WIS.



A-1652

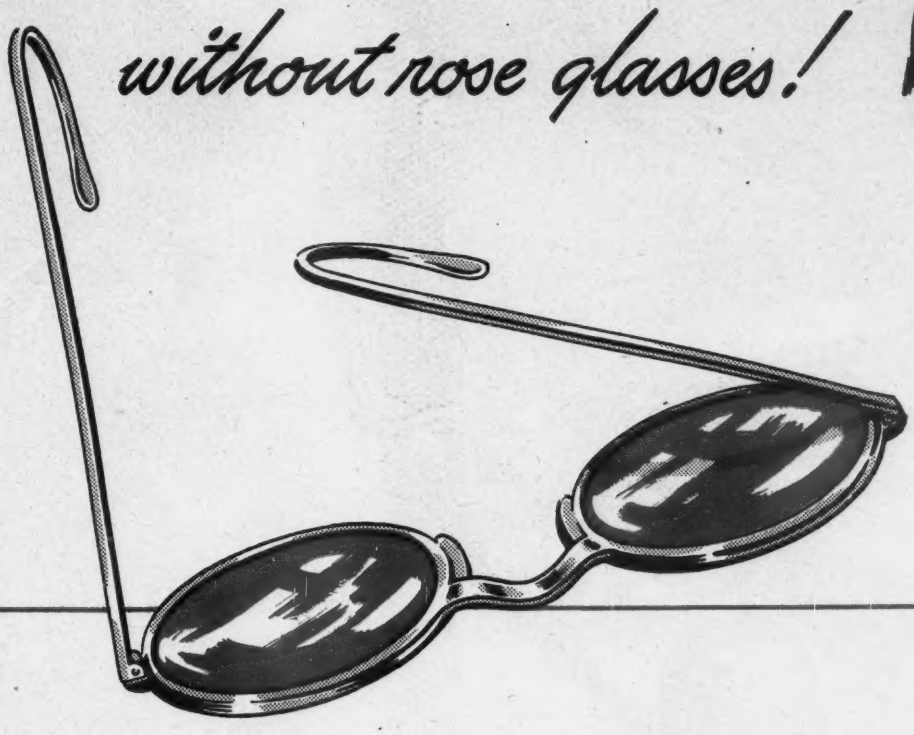
ALLIS-CHALMERS MOTORS

When you do need new motors, look into the strength, solidity and all-around protection of the new "Safety Circle"—protected top, sides, ends and bottom.

AC WE WORK FOR VICTORY WE PLAN FOR PEACE

Look over your packages...

without rose glasses!



Sure, almost anything sells today, in barrels or in the "nude." But there'll come a time when folks will be more persnickety, and that's when your product will rise up and shout for a protective and an attractive package.

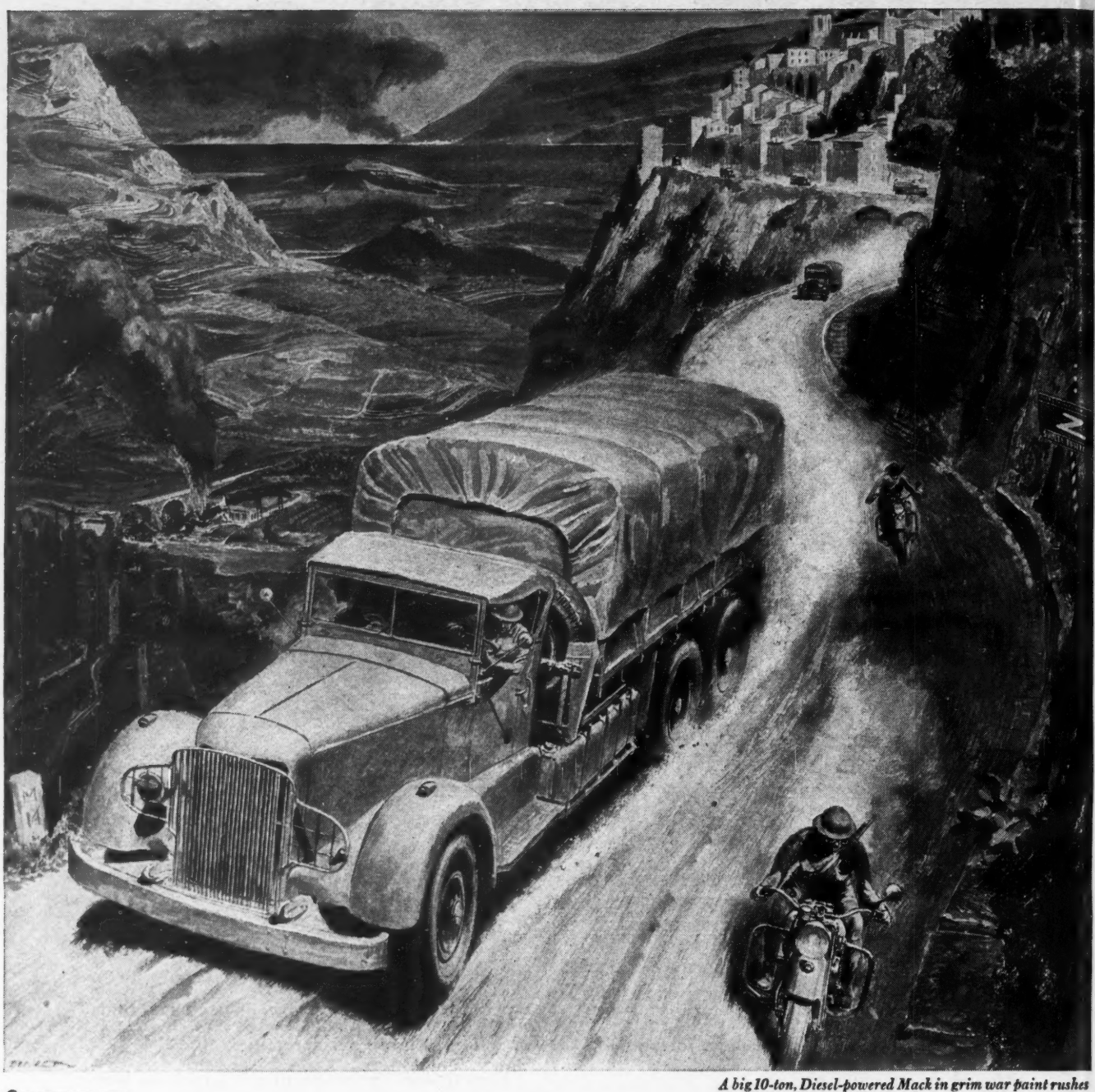
More than ever, your product will need sales appeal. Its advantages must be apparent to every clerk, and it will need to stand out among others in the kitchen cupboard or the bathroom cabinet.

So, now is the time to throw away the rose-colored glasses, and give your package a realistic appraisal. Perhaps it needs one of the many types of converted cellophane, or laminated films or foils which are our specialties.

Even though our production is largely on War work, our Packaging Specialists have some time to think, and they are eager to work with you. Because improved packages can't be designed and proved over night, we suggest that you start now. There's no obligation.

THE DoBECKMUN COMPANY

3301 MONROE AVENUE, CLEVELAND, OHIO · WESTERN PLANT, OAKLAND, CALIFORNIA



©1943 MACK MFG. CORP.

A big 10-ton, Diesel-powered Mack in grim war paint rushes supplies to the front. Sketched from photos, by Peter Helck.

WAR REPORT... WITH A PEACETIME TWIST?...

For your future reference, we'd like to put two facts on the record now. *Fact One*—there are *more* Mack Diesels in the United Nations' armies than any other make of heavy-duty Diesel truck. *Fact Two*—the only 10-ton Diesel trucks used by United Nations' armies which are made and powered by one manufacturer are Macks. This may surprise you . . . and it may mean a lot some day when *you* are deciding what Diesel to buy.

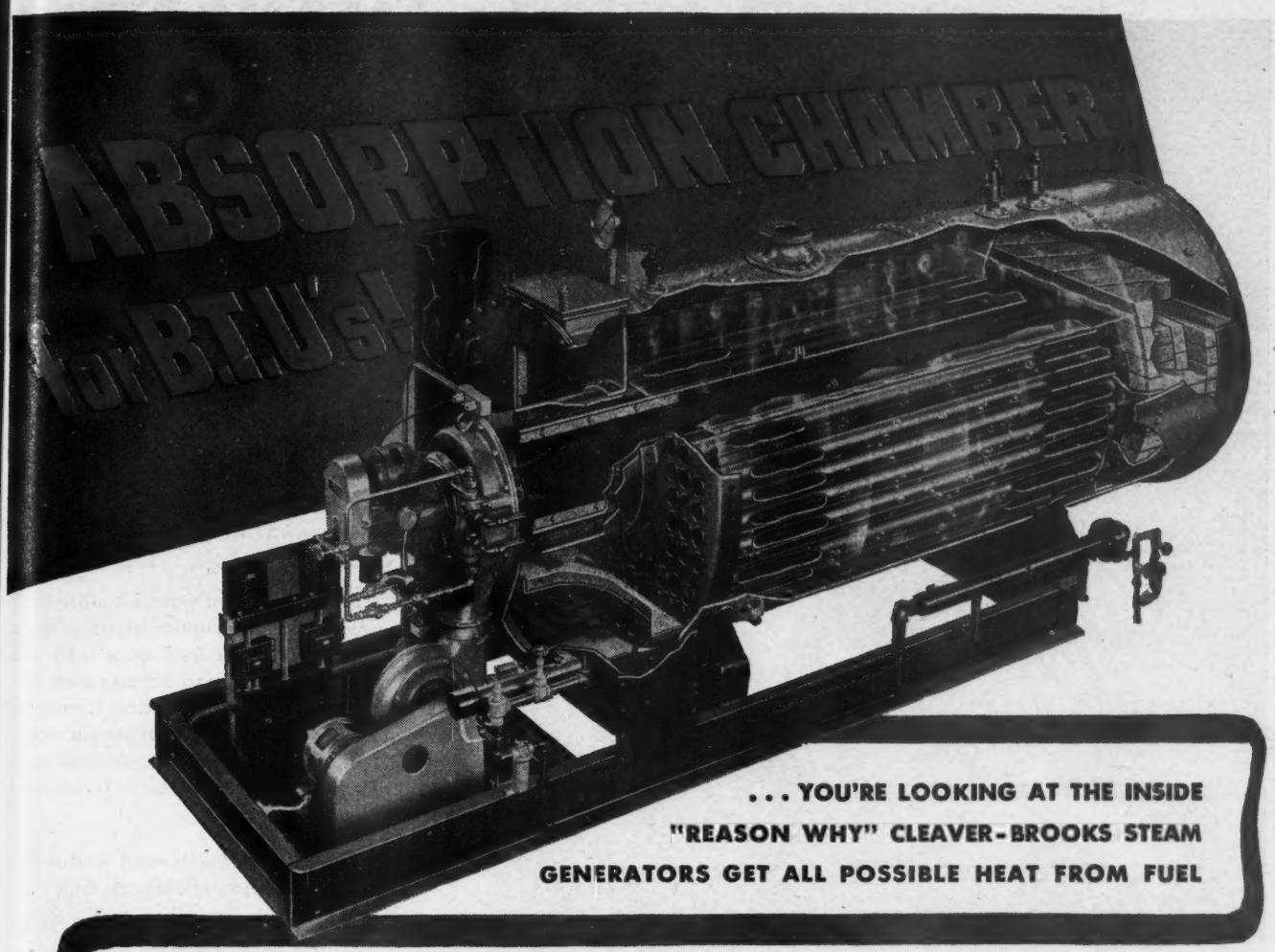
Mack Trucks, Inc., Empire State Building, New York, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!



. . . YOU'RE LOOKING AT THE INSIDE "REASON WHY" CLEAVER-BROOKS STEAM GENERATORS GET ALL POSSIBLE HEAT FROM FUEL

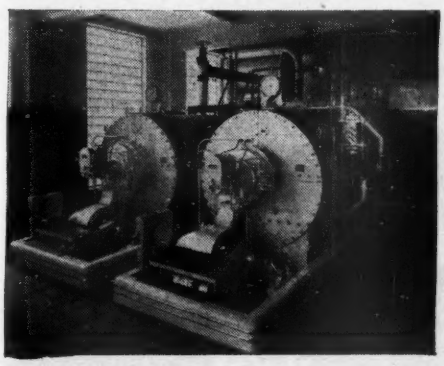
The basic reason for the high thermal efficiency and low fuel costs of Cleaver-Brooks Steam Generators is graphically shown above.

The remarkable thermal efficiency of more than 80% of a Cleaver-Brooks Steam Generator is accomplished by the original and exclusive Cleaver-Brooks four-pass, down-draft construction of the boiler.

Note the four complete passes of combustion gas travel through the entire tube length of the boiler proper, with the fourth and last pass at the bottom, assuring equalized stress over the entire shell surface.

It is these extra economizer passes which enable the boiler to absorb the greatest practicable amount of heat from the fuel burned. With a Cleaver-Brooks Steam Generator exhaust temperature is only 125° above that of steam and water in the boiler; CO_2 analysis is not less than 14%.

Quick steaming capacity — minimum man-power needed for operation and maintenance — cleanliness, no smoke, ashes, clinkers — compact, space-saving design — simple, low-cost installation — dependable performance — these are all added advantages of a Cleaver-Brooks Steam Generator.



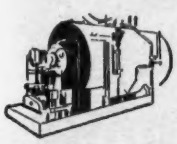
Showing two 300 HP. Cleaver-Brooks Steam Generators as installed at the Downing Box Co., Milwaukee. Note compactness and entire absence of breeching and feed-water piping — all piping concealed in pits below floor level.

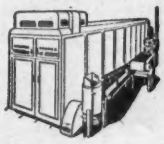
Get complete information now—for the future — on Cleaver-Brooks Steam Generators — sizes 20 to 500 HP.; pressures 15 to 200 lbs.

CLEAVER-BROOKS COMPANY
5103 North 33rd Street Milwaukee 9, Wisconsin

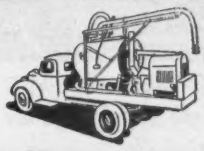
Cleaver-Brooks
STEAM GENERATORS

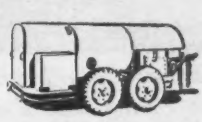
CLEAVER-BROOKS PRODUCTS INCLUDE:

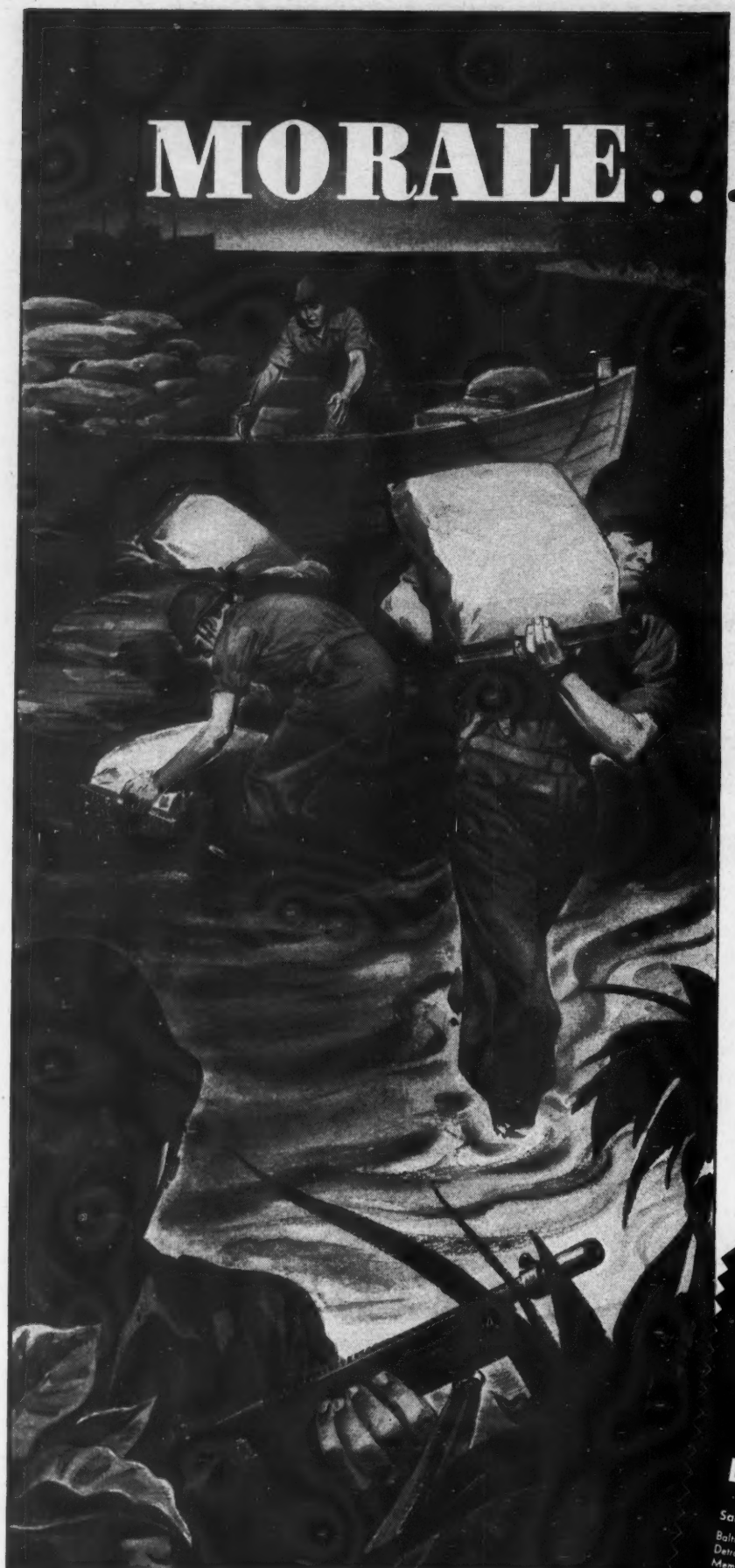

Steam Generators


Food Dehydrators

Tank Car Heaters


Bituminous Boosters


Special Military Equipment



MORALE . . . *in Bags*

Morale among fighting men depends upon full mess kits, and Uncle Sam spares no effort to see that his warriors on land and sea are the best fed in the world.

Getting this all important food to the men on our far-flung fronts in a sound, wholesome condition is just as important as "keeping their powder dry." It's a task that calls for wide experience and know-how . . . a task the bag industry has taken in its stride.

In the 22 Bemis mills and factories more than 8,000 employees have made millions of bags to protect and transport food over land and sea, from farm and factory to fighting men. We like to think this our contribution to morale for Victory. In addition to this important work, we still find time to supply industry and agriculture with bags for other war materials and essential civilian goods.

Food Industry Cuts Costs and Reduces Losses with Bemis Multiwall Bags

Bemis Multiwall Paper Bags for powdered or granular products are economical, one-trip containers that guard against moisture and thus reduce caking and loss of quality. Their extra strength maintains output by minimizing breakage on production lines. Bemis patented self-forming gussets speed filling and closing. Brilliant Bemis printing makes brands stand out.

Let us work with you in supplying bags for your war or civilian production. From the bags themselves to their filling, closing, shipping and storing, our staff of experts can help you. If you have a packaging problem . . . present or future . . . let's talk it over.

BEMIS BAGS

BEMIS BRO. BAG CO.

Peoria, Ill. • East Pepperell, Mass. • Mobile, Ala. San Francisco, Calif. • Wilmington, Calif. • St. Helens, Ore. Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver Detroit • Houston • Indianapolis • Kansas City • Las Angeles • Louisville Memphis • Minneapolis • New Orleans • New York City • Norfolk • Oklahoma City • Omaha • St. Louis • Salina • Salt Lake City • Seattle • Wichita

BETTER BAGS FOR 85 YEARS

Among the bags produced for war service by Bemis are Multiwall Paper Bags slipped over cloth bags for foods to be shipped overseas. These packages are especially designed so they can be tossed into the water and carried ashore without damage to contents.

Prevent Valve Failure *before it starts!*

DON'T THROTTLE GATE VALVES
. . . this wedge and seat face were ruined by wire drawing effect

IT CAN'T HAPPEN TO YOUR GATE VALVES IF...

IF you use Gate valves only for services for which they are designed, you will avoid needless destruction of valves. They are not intended for throttling purposes. The ruined wedge and seat faces pictured here show the result of using a Gate valve partially open to regulate flow. Wire drawing effects are an almost certain result of such misuse, when Gate valves are used in steam, condensate, or other services where foreign matter may be present. For throttling service, use a Plug Seat Globe valve, or a Renewable Disc Seat Globe valve equipped with Jenkins Throttling Nut.

Similar destruction of seating faces is often caused by scale and other foreign matter lodging between the seat ring and wedge faces. And, you can take steps to minimize that possibility. When installing valves and piping, have workers look into them, see that they are clean. After a valve is installed, flush it out periodically . . . close the valve so a small flow under greater pressure is obtained to dislodge any foreign matter that might be in the valve.

Most important is regular inspection of valves. At the first sign of leaks, action should be taken to remove the cause, and repairs should be made before the destruction progresses beyond the repairable stage.

VALVE CONSERVATION PAYS...AND PREVENTS SLOW DOWNS IN WAR PRODUCTION

In peacetime it is wise management to pay close attention to valve conservation. It pays handsome dividends. In today's emergency, valves *must* be kept in efficient operation. Failure of control over vital power and fluids may interrupt the victory-pace of production.

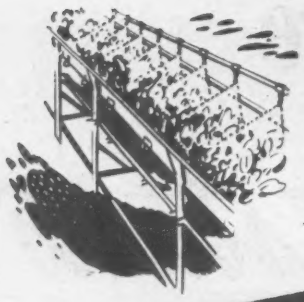
Also, neglect of valves is an inexcusable waste of important metals. New valves can be obtained only for certain uses. Many valves in present use must be kept for the duration.

Inspect valves systematically. Make repairs before serious deterioration begins. Instruct new maintenance men thoroughly. Select new valves with extra care, and have them installed properly. Check up on your program of valve conservation and see that it is adequate. Jenkins Engineers will gladly provide any assistance you need. Send details of present valve problems.

JENKINS VALVES

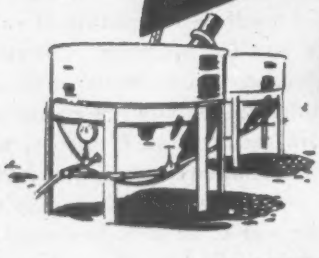
For every industrial, engineering, marine and power plant service . . . in Bronze, Iron, Cast Steel and Corrosion-Resisting Alloys . . . 125 to 600 lbs. pressure.

Jenkins Bros., 80 White Street, New York 13, N. Y.; Bridgeport; Atlanta; Boston; Philadelphia; Chicago. Jenkins Bros., Ltd., Montreal; London.

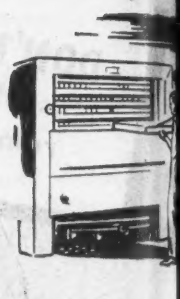


WET *or* DRY

— in all food processing, G-E equipment will give you fast, dependable operation and close control of quality



HOT *or* COLD



COOKING - FREEZING - CANNING - DEHYDRATION—today there's a new test they all have to meet: how can you "make time" in processing, to get as much as possible of America's precious foodstuffs accumulated to meet the abnormal demands ahead?

General Electric equipment such as shown here, applied with the aid of G-E engineers, helps you in this "battle against time" in three important ways:

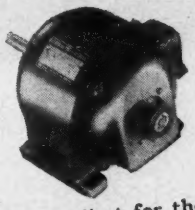
1. INSTALLATION IS FAST AND SIMPLE, because G.E. has such a wide range of standard units having the built-in protection to meet excessive wetness, high temperatures, dust-filled atmospheres and the like. Special enclosures, canopies, etc. are not necessary.

2. CONTINUOUS OPERATION IS PROTECTED, because G-E equipment is built to deliver rated output 'round the clock. Properly applied with the help of our engineers, it relieves you of worry over minor electrical breakdowns that can "stall" an entire line.

3. QUALITY CONTROL IS EASILY OBTAINED. G.E. builds a wide range of instruments—such as timers, recorders, and pressure gages—for the control of all kinds of processes. You can easily select from this product line the right combination to give you smooth, reliable control of quality at the machine or from a centralized panel.

Why not centralize responsibility for the electrical side of your food processing by making it a G-E job throughout? Practically all standard food-plant equipment can be obtained G-E equipped. In addition, our engineers will work with you on application problems for the over-all plant set-up. Just call your local G-E office or write to General Electric Company, Schenectady, N. Y.

G-E "SPLASHPROOFS" STAND UP ON VEGETABLE WASHING LINES



Need a motor to withstand the inevitable splashing and dampness of washing or wet preparation of vegetables? G-E Tri-Clad splashproof motors on conveyors, pumps, etc. are "set for the wet"—they do not need protecting canopies. Windings have *extra protection* against shorts and breakdowns due to dampness. Ball-bearings are fully enclosed. Frame and end shields resist corrosion.

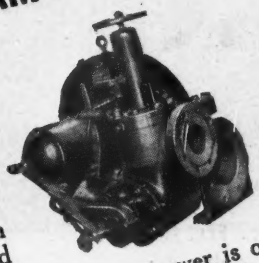
When you're buying pumps, cutters, or mixers for wet places anywhere along the line, ask the builder to ship them equipped with Tri-Clad splashproof motors. And don't pass up the standard, open Tri-Clad motor for drives elsewhere in the plant.

TIME SWITCHES SIMPLIFY PROCESS CONTROL

For dehydration cycles, blanching, baking, or what have you—wherever a process must start and stop at predetermined time intervals, there's nothing more convenient and reliable than G-E time switches. Standard types will (1) "time" a process after manual start, or (2) repeat a start-stop cycle continually.

G-E engineers will be glad to work with you in applying time switches to heating, drying, refrigerating, or processing cycles in new plant layouts, or to help save man power by making your present processing more automatic.

POWER PLUS STEAM FOR DRYING TUNNELS

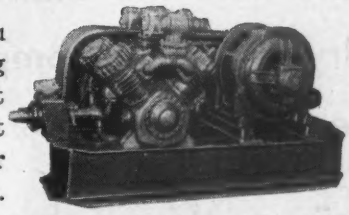


For blower drives on drying tunnels, a G-E Type D mechanical-drive turbine is an ideal power source. It does double-duty, for the exhaust steam is automatically regulated to the exact pressure required in the heater coils, and the power is obtained as a by-product. G-E Type D mechanical-drive turbines are equipped with the exclusive, built-in combined trip and throttle valve, which means greater safety. Built in sizes from 5 to 200 hp.

An Operating Puzzle? Try Electronics

From peeling to packaging there are spots where electronic control can help you do a more accurate or more automatic job: automatic weighing; close, adjustable speed control; counting; inspection; measurements; filling and wrapping, to name only a few. Call on G-E application engineers whenever you have a control problem.

G.E. OFFERS HELP ON COOLING . . . . FREEZING

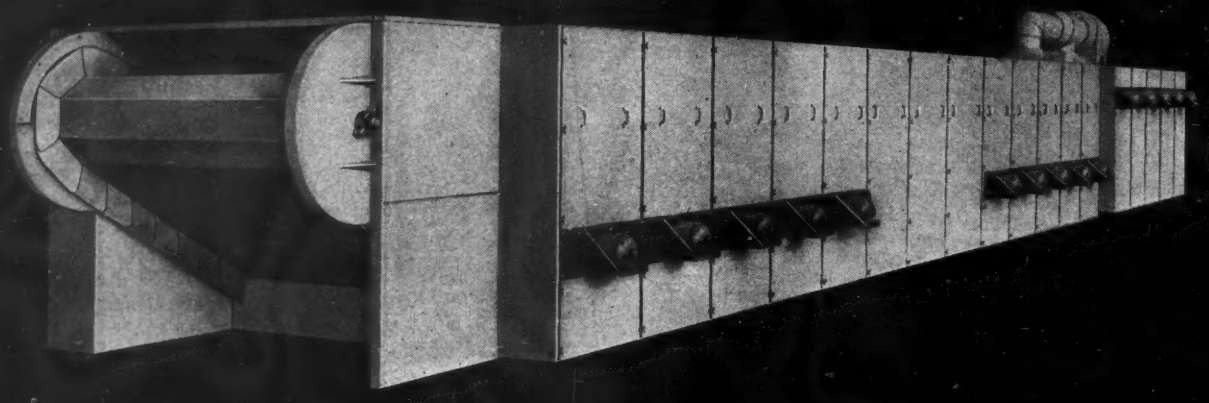


Our industrial-refrigeration department can help you solve many freezing, cold-storage, and air-conditioning problems. And where other electric apparatus must "tie-in" with refrigeration processes, you'll find that these refrigeration specialists, working with our regular industrial engineers, make an unbeatable combination.

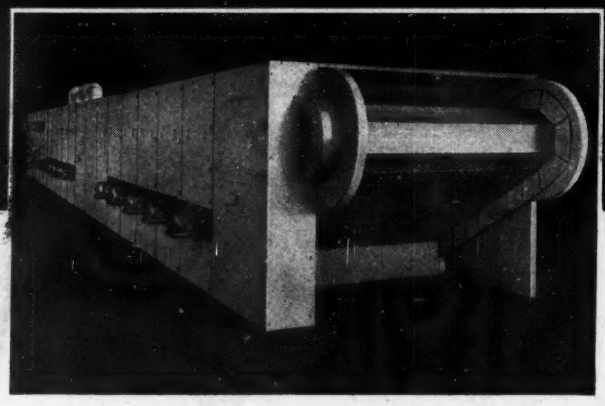
BUY WAR BONDS

GENERAL ELECTRIC

The HUNTER *continuous dehydrator*



FOR AUTOMATIC,
UNIFORM PRODUCTION



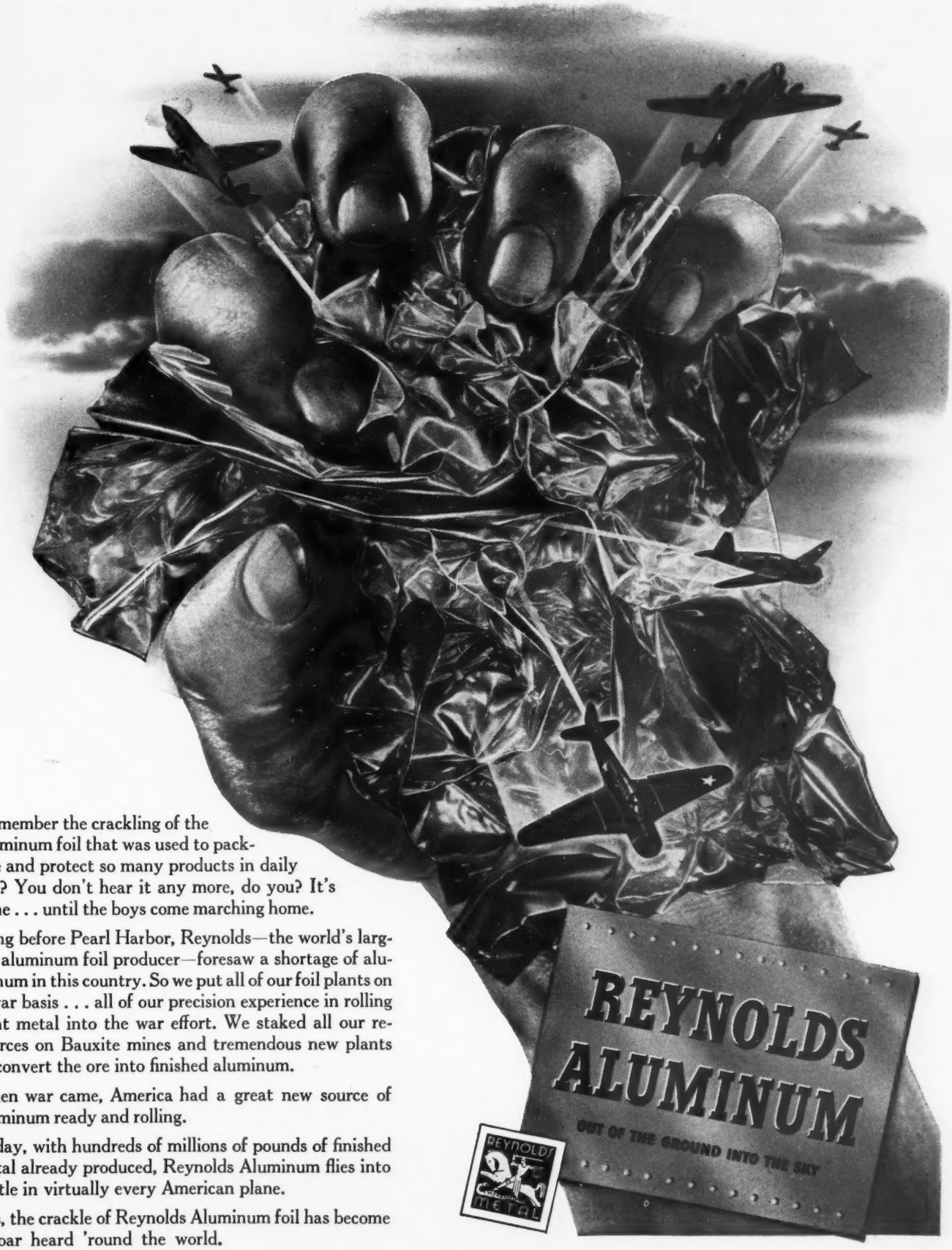
Illustrations show the new HUNTER Continuous Food Dehydrator. It comes completely equipped with all necessary controls for maintaining necessary temperatures and humidity. It is adaptable to continuously dehydrating a wide variety of food products.

The operation of this new, modern HUNTER unit is completely automatic from the time the blanched product is delivered to the feed end of the dryer until the completely dehydrated product is delivered to the proper containers.

For full details on this modern unit write to HUNTER ———

JAMES HUNTER MACHINE CO.
NORTH ADAMS, MASSACHUSETTS
FOUNDED 1847

The Crackle that Grew to a Roar!



Remember the crackling of the aluminum foil that was used to package and protect so many products in daily use? You don't hear it any more, do you? It's gone . . . until the boys come marching home.

Long before Pearl Harbor, Reynolds—the world's largest aluminum foil producer—foresaw a shortage of aluminum in this country. So we put all of our foil plants on a war basis . . . all of our precision experience in rolling light metal into the war effort. We staked all our resources on Bauxite mines and tremendous new plants to convert the ore into finished aluminum.

When war came, America had a great new source of aluminum ready and rolling.

Today, with hundreds of millions of pounds of finished metal already produced, Reynolds Aluminum flies into battle in virtually every American plane.

Yes, the crackle of Reynolds Aluminum foil has become a roar heard 'round the world.

REYNOLDS METALS COMPANY • General Offices, Richmond, Va. • Parts Division, Louisville, Ky. • 37 PLANTS IN 13 STATES

Greater than the "Exodus"

Since war started, a movement of people has taken place in America which is even greater than the historical "Exodus" from Egypt to the Land of Canaan. It is the migration of millions upon millions of people to war production centers. This large and rapid shift in population to relatively few cities, accompanied by the construction of thousands of new homes and factories, has enabled Highway Transport to make one of its greatest war contributions. Here's evidence from the metropolitan center of the nation's second largest war production area:

In two years its population has increased more than 300,000. Its coach lines carried 30,000,000 more passengers in 1942 than in 1941. An estimated 85% to 90% of the motor trucks on its highways carry loads of vital war materials and products.

GMC TRUCK & COACH DIVISION
General Motors Corporation
Home of GMC Trucks and GMC Yellow Coaches . . . Manufacturer of a Wide Variety of Military Vehicles for our Armed Forces

Joseph B. Eastman, director of the Office of Defense Transportation, recently stated: *"Automotive Transportation is absolutely essential to the winning of the War. Goods must reach their destinations and workers must get to their jobs . . . on time."* Join the U. S. Truck Conservation Corps and keep your trucks in best possible condition. Your GMC dealer is pledged to help you.

Pledged U.S. TRUCK CONSERVATION CORPS

INVEST IN VICTORY
. . . BUY WAR BONDS AND STAMPS

Take a Look at TOMORROW—*Today!*

Mr. Now: Dried out, *soaked, and baked,* eh! So that's why Century Motors stand up!
Mr. Postwar: I'll remember that — it's another reason why I shall specify *Century* Motors.

Century Form J Motor

The Protection of
CENTURY INSULATION
Assures Continuous Motor Performance Under the Toughest Conditions

By the use of slow-moving conveyors and automatically-controlled ovens, the completed stator and winding of Century Motors is dehydrated, and then is submerged in and passes through a tank filled with Century "Clingto" insulating varnish, and then baked. This process is repeated as necessary to preserve and seal the winding into a homogeneous mass.

This is followed by a final coat of Century "Protecto" insulation compound which places a heavy exterior protecting armor over the entire winding.

Century slot insulation is built up with fibre board for mechanical strength and varnished cloth for dielectric strength.

The entire Century insulation process produces a winding that is highly resistant to moisture, to tropical climatic conditions, to mild acid and alkali fumes, and to the effect of magnetic vibration and the mechanical impact of particles carried by the cooling air.

Such insulation material and treatment is absolutely necessary for motor protection for long operating life.

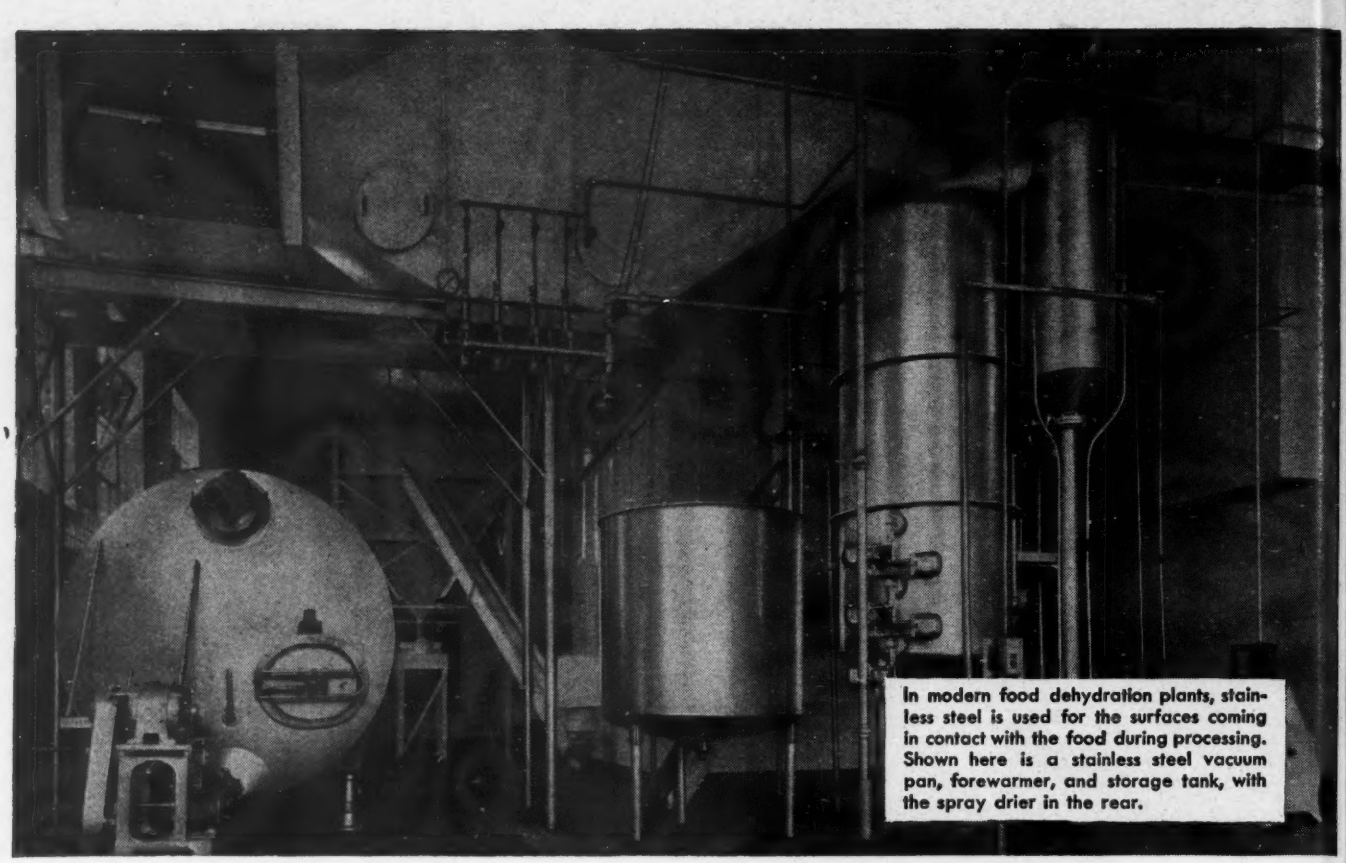
Your nearest Century Application and Service engineer will gladly give you full details of all the advantages of Century Motors—show you why thousands of plants rely on Century for continuous, all-out production.

Century MOTORS
1/6 to 600 horsepower

CENTURY ELECTRIC CO.
1806 Pine Street
St. Louis, Missouri
Offices and Stock Points in Principal Cities

307

One of the Largest EXCLUSIVE Motor and Generator Manufacturers in the World.



In modern food dehydration plants, stainless steel is used for the surfaces coming in contact with the food during processing. Shown here is a stainless steel vacuum pan, forewarmer, and storage tank, with the spray drier in the rear.

Protect Food Vitamins, Colors, and Flavors

By Using Stainless Steel Equipment

FOOD processors report that stainless steel equipment is increasing the effectiveness of many dehydration units. The stainless steel protects food vitamins, colors, and flavors by preventing metallic contamination. This freedom from contamination also has been found to reduce food spoilage and cut waste.

Not only in food dehydration, but in all food processing, stainless steels are used to advantage. Stainless steels are easy to clean, and to keep clean. Maintenance time and costs are reduced to a minimum, because stainless steels will not corrode, scratch, or chip. Kettles and cutlery, pasteurizing and freezing units have a longer service record when made of a stainless steel.

We do not make stainless steels, but we produce the ferro-chromium and other alloys used in steelmaking. With the knowledge accumulated from 35 years of experience with alloy steels, our metallurgists can give you impartial advice on the selection or use of a stainless steel for your job. For information on stainless or other alloy steels, consult us without obligation.

BUY UNITED STATES WAR BONDS AND STAMPS

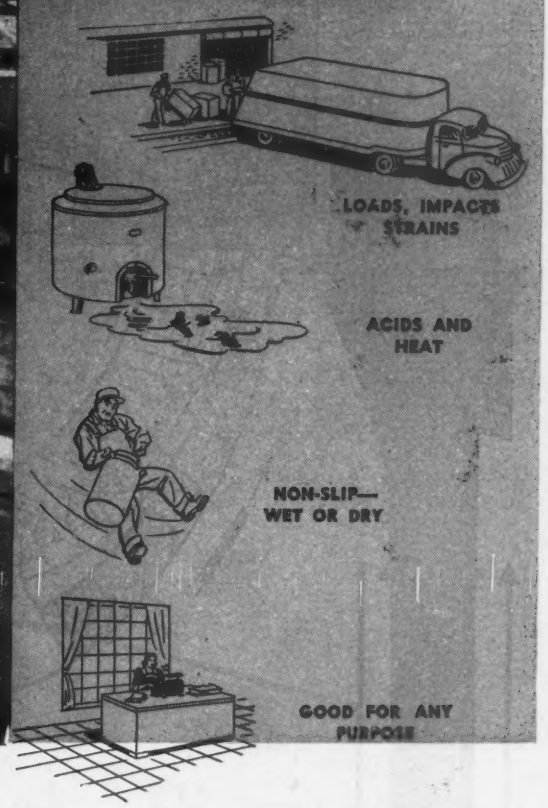
ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Electromet
Trade Mark
Ferro-Alloys & Metals

Emery Aggregate

MEETS ALL DAIRY FLOOR REQUIREMENTS!

Cut-away view of topping of CP Emery Aggregate, showing its compact structure and bond with base floor.



SPECIAL NOTE: Cortland Emery Aggregate (produced by the Walter Maguire Company, Inc., and nationally distributed by The Creamery Package Mfg. Company under the name CP Emery Aggregate) is *"acceptable as a substitute for Aluminum Oxide Abrasive in concrete floor topping, stair tread, fills, etc., according to Construction Division letter No. 426, August 29, 1941 from the War Department, Office of the Quartermaster General, Washington, D. C.*

No matter what floor problems you face, investigate CP Emery Aggregate. If you need new floors, this hard, dense, non-slip material, mixed with High-Early-Strength Portland Cement, is easily and quickly applied . . . will be ready to carry full loads in 48 hours. Where the base floor is in good condition, CP Emery Aggregate can be used as a topping, as the hard, sharp, irregular emery particles bond with the base to give unusual strength and durability.

In *non-slip* rating, CP Emery Aggregate is unique. Whereas stone and gravel aggregate wear smooth under traffic, the hard, abrasive emery particles *retain* their gripping power . . . even when wet. In short, CP Emery Aggregate is a durable, non-slip floor which stays that way under all conditions of wear, heat and moisture. Has everything for making the ideal floor for processing rooms, loading platforms, truck runways, offices, etc. Ask for Bulletin W-761.

Creamery Package

THE CREAMERY PACKAGE MFG. COMPANY, 1243 W. Washington Blvd., Chicago 3, Ill.

The Protection of Modern Packaging In Conveying Materials

Bulk-Flo
ELEVATOR-CONVEYOR-FEEDER

This modern method of handling flowable, granular, crushed, ground, or pulverized materials of a non-abrasive, non-corrosive nature gives you dust tight operation. It minimizes breakage and degradation, prevents leakage, and reduces explosion and fire hazards.

The flights, which extend across practically the entire section of the casing, form a series of compartments that hold the material. Each compartment is in itself a veritable package assuring cleanliness, freedom from contamination, and from exposure.

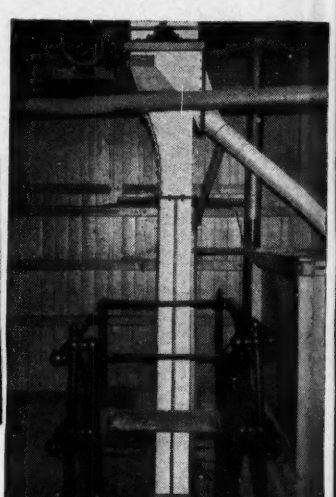
Bulk-Flo is self-feeding, self-discharging, and, to a high degree, self-cleaning. It saves space and can be laid out to carry vertically, horizontally, around corners, along curves, and on slants of any degree. Write for Book No. 1975 to get the complete story and to see the possibilities of Bulk-Flo in your service.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8.

Offices, warehouses and distributors in principal cities. 9325

LINK-BELT
Bulk-Flo
ELEVATOR-CONVEYOR-FEEDER



The above illustration shows head end of compact, encased, Link-Belt Bulk-Flo elevator with chute to bin in sugar bagging department of a Michigan beet sugar company. Capacity 25 tons per hour. One of the important results of this handling is that the sugar crystals retain their sparkle and breakage of crystals is practically nil. Operates either fully or partially loaded and cleans itself out at the end of a run.

IT'S GOOD *for what ails them*

You can't walk around your plant like a doctor with a thermometer, but unless you have modernized recently with temperature controls, many of your process operations are below par in output, and wasting heat or cooling water at the same time.

Sarco controls are simple, inexpensive, and easy to install. They are positive in action, time tested, and built in a modern plant devoted exclusively to steam traps and temperature controls.

Industrial temperatures are vital to the all-out production effort now. They will be vital for survival in the post-war competitive economy as well. The time to get your plant operations temperature-perfect is now. Our nearest representative will tell you how.

SARCO TEMPERATURE CONTROL

Rx SIMPLE PRESCRIPTIONS

1

The Sarco TR-40 for cooling control of engine or compressor jackets, condensers and stills will save up to 50% of the water now used. Catalog No. 700.

2

The Sarco No. 87 liquid expansion steam trap for outdoor service, also used as control for process equipment and tanks heated by steam coils. Catalog Nos. 250 and 550.

3

The Sarco type TR-21 temperature regulator, liquid expansion, positive operation, packless valves, for hot water and process operations. Catalog No. 600.

4

Sarco Electric Control: room thermostats, limit controls, aquastats, immersion types, and motor valves for heating, air conditioning and industrial applications. Catalog Nos. 1025 and 1050.

SARCO
Saves Steam

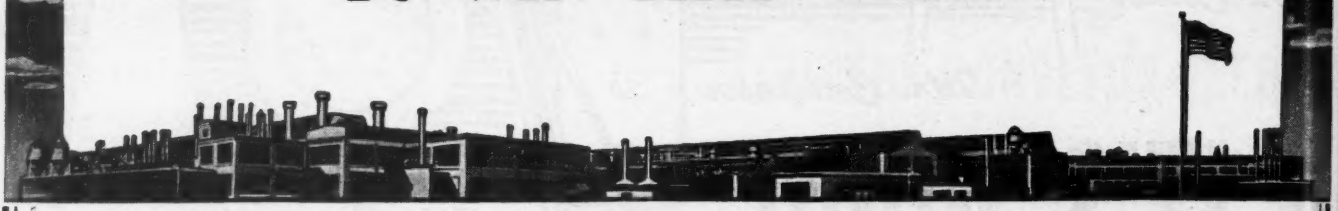
SARCO COMPANY, INC.
475 FIFTH AVE. NEW YORK 17, N. Y.

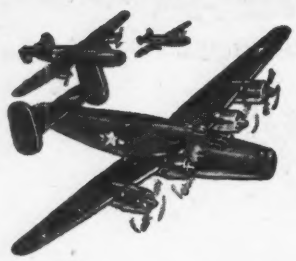
SARCO CANADA, LTD.,
85 Richmond Street, West, TORONTO, ONTARIO

Represented in Principal Cities

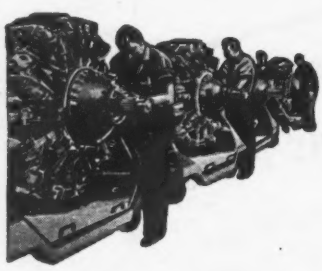
2

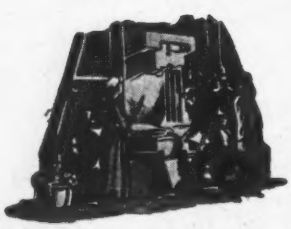
"WE'RE WORKING TOGETHER
-just as America's Armed Forces are Fighting Together-
TO WIN THIS WAR!"



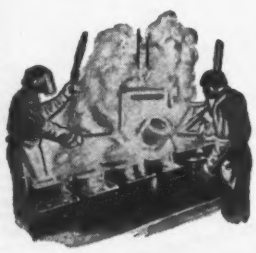


Two Types of Pratt & Whitney Aircraft Engines, One for B-24 Liberator Bombers and One for C-47 and C-53 Cargo Planes





Millions of Pounds of Aluminum Forgings Every Month

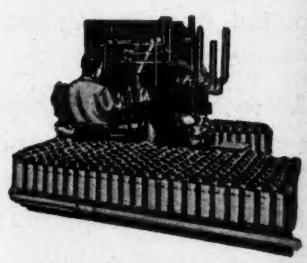


Magnesium Castings for Aircraft Engines

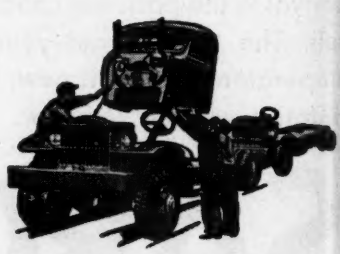
It takes *teamwork* to win wars; and Chevrolet is a willing *teamworker* with America's armed forces and with other war producers in this greatest of all world conflicts. . . . Our role in America's war effort is twofold. . . . We are a *major producer*—building Pratt & Whitney aircraft engines, anti-aircraft guns, high-explosive and armor-piercing shells, aluminum and steel forgings, iron and magnesium castings, military trucks and other products for our fighting men. . . . And we are also a *major supplier* for other war contractors—making vital parts by the million for more than 120 other important war producers. . . . America's industrial leaders are *working together* and winning the battle of production, just as America's armed forces are fighting together and winning battles in the field. Chevrolet is proud to be playing its full part by serving as major producer and major supplier too.

Today Chevrolet Has More Than Sixteen Million Square Feet of Floor Space Devoted to the Production of Volume for Victory

90-mm. Anti-Aircraft Guns for America's Armed Forces



High-Explosive and Armor-Piercing Shells



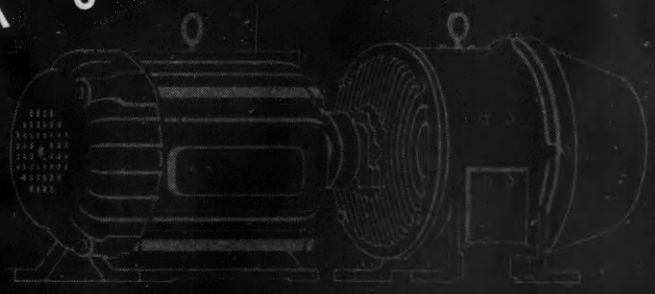
Thousands Upon Thousands of Military Trucks

CHEVROLET
DIVISION OF
GENERAL MOTORS

BUY BONDS
FASTER
BRING VICTORY
CLOSER

C W

MARK OF DEPENDABILITY



C-W has been a *mark of dependability* on motors and generators for over 50 years.

Powering the war effort, on land and sea, may be found many Crocker Wheeler motors and generators which were made over a generation ago . . . yet are serving quietly, faithfully and economically, with a minimum of attention.

If you need rugged, dependable motors and generators, write or wire us, or consult our nearest office. We can make immediate shipment on many types.

CROCKER WHEELER ELECTRIC MANUFACTURING CO.
Ampere, N. J. • Division of JOSHUA HENDY IRON WORKS

CROCKER WHEELER
Trade Mark Reg. U. S. Pat. Off.
Motors - Generators

For engineering and service information, call

*Boston	(COM 6907)	*Detroit	(TR 2-5785)
*Buffalo	(CL 4985)	New York	(CO 7-6700)
*Chicago	(FRA 1616)	Philadelphia	(WAL 1444)
Cincinnati	(MA 1345)	Pittsburgh	(AT 9818)
*Cleveland	(MA 3255)	*San Francisco	(EX 5531)
	Washington (EX 1991)		

. . . or your local Crocker Wheeler dealer *Local Stock

Be SURE . . . with
CROCKER-WHEELER

Other JOSHUA HENDY IRON WORKS factories at Sunnyvale, Pomona, Torrance, and Long Beach, California, and St. Louis, Mo.

ONLY THE BEGINNING

This year's bumper farm crop would be of little use to humanity in the form in which it is delivered to the elevators, the canners and the packers.

Growing this food is only the beginning of processing, packaging and shipping operations that are complex enough at any time — but doubly difficult to-day with so many substitutes and shortages. In meeting these increased problems, the food industry has done a really remarkable job — assuring our government that the nation's food supply will be properly preserved, ready to use whenever and wherever it may be needed.

Riegel mills and laboratories have been working full time to help meet the new technical requirements and the increased demands of the food industry. This has necessarily limited our ability to supply all our customers with all they want, but when it's over we will come to you with a wealth of experience and countless new products. In the meantime, if you are tackling post-war problems now, you will find us ready, willing and able to help you.

RIEGEL PAPER CORPORATION

342 MADISON AVENUE • NEW YORK 17, N. Y.

Pomona Pumps Used for Navy's Greatest Salvage Job!

Probably never in the history of this nation has a more desperate battle against time been waged than in the operations shown here... the U. S. Navy's raising of sunken warships at Pearl Harbor. The size of the project and the speed and efficiency with which it was accomplished make it one of the great engineering feats of all time...

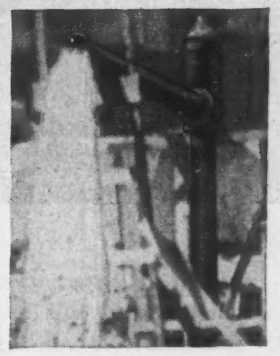
This official Navy photograph shows one phase of this grim race... the job of dewatering and raising the giant warships. Here was a pumping operation involving unusual difficulties... a problem of removing millions of gallons of sea water in great volume and without interruption of flow... *corrosive* water, mixed with oil scum from burst fuel tanks... water laden with harbor muck, gritty sands and rust ... *the toughest kind of a pumping job.* Added to this—working space was extremely limited, and time so precious that none could be wasted on equipment breakdowns!

High up on a column pipe in the photo above you can see the pump that the Navy used for this tough dewatering job—A POMONA PUMP!

What has this to do with YOUR pumping operations? Simply this... when the chips are down and there's a pumping job to do—*and do with maximum dependability, speed and efficiency*—Pomonas are the pumps to use. So why be satisfied with anything less than Pomona performance on ANY pumping operation? Let your nearby Pomona distributor study YOUR pumping job and show the many savings Pomona Pumps can make!

JOSHUA HENDY IRON WORKS

Pomona Pump Co., Division • 50 Church Street, New York 7, N. Y.
Plants: 4301 So. Spring Ave., St. Louis 16, Mo.; 206 Commercial St., Pomona, Calif.



Close-up of the Pomona Pump at work on the *U.S.S. California*. Note below some of the features that make Pomona Pumps outstanding for ALL water-moving purposes...

CUT POWER COSTS

Pomona's semi-open impellers, easily adjustable at motor, vary the capacity of the pump according to requirement... and with proportionate savings in power. Eliminates wasteful throttling of flow!

SAVE SPACE

Pomona's modern vertical design puts the pump at water level where it needs no priming.. the motor at floor level where it occupies minimum space. Eliminates complicated piping and priming equipment!

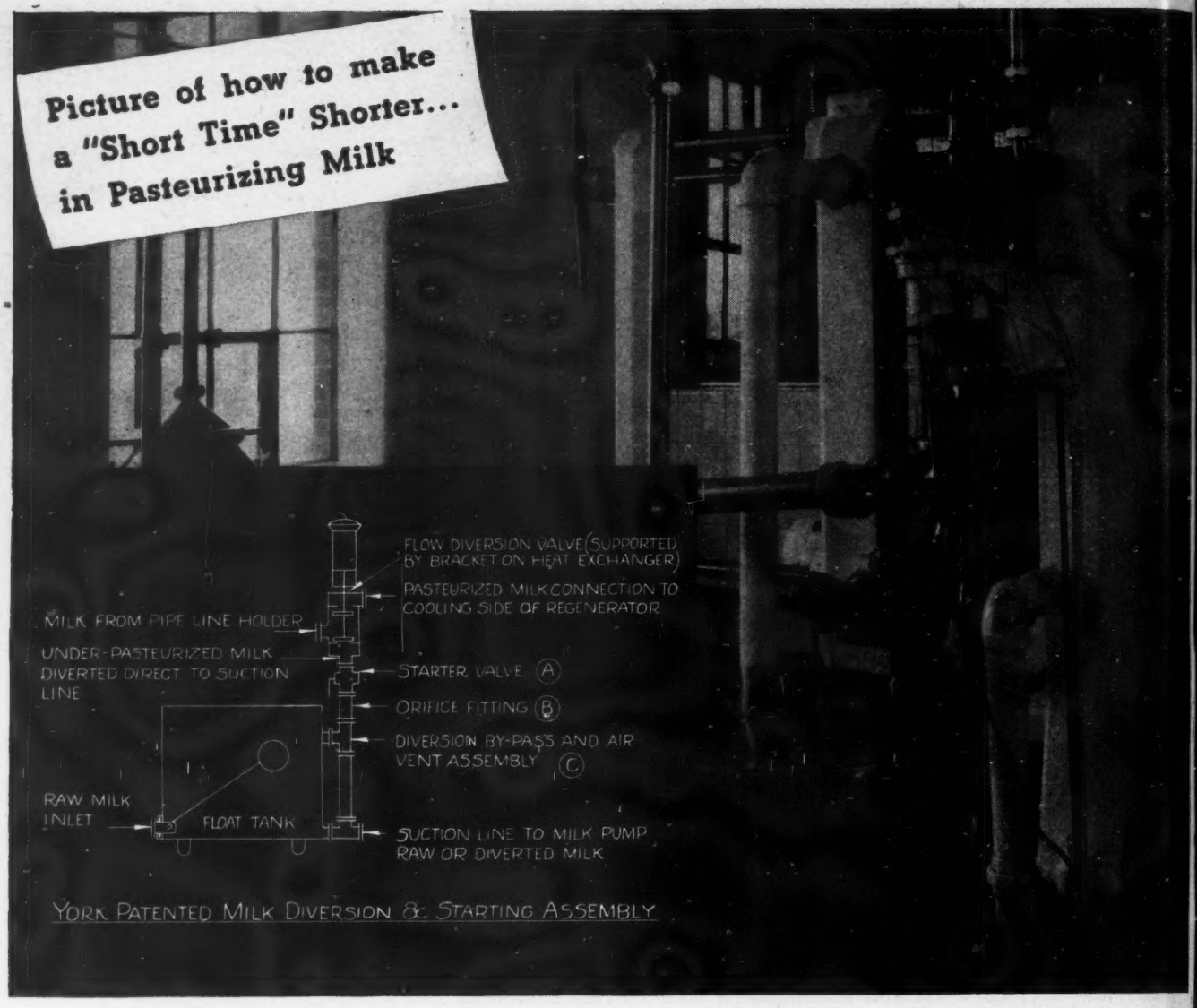
TROUBLE-FREE OPERATION

Because all bearings below the motor head are fully lubricated by the fluid being pumped there is no risk of contaminating product or equipment with oil film. No oil tubes or grease chambers to maintain.

DELIVER MORE WATER

90%—and higher—pump efficiencies are not uncommon due to Pomona's Bulbous Vane End shape which smooths fluid flow—minimizes friction loss—increases pump efficiency!

POMONA
Water-Lubricated
PUMPS


Picture of how to make a "Short Time" Shorter... in Pasteurizing Milk
FLOW DIVERSION VALVE (SUPPORTED BY BRACKET ON HEAT EXCHANGER)
PASTEURIZED MILK CONNECTION TO COOLING SIDE OF REGENERATOR
MILK FROM PIPE LINE HOLDER
UNDER-PASTEURIZED MILK DIVERTED DIRECT TO SUCTION LINE
STARTER VALVE (A)
ORIFICE FITTING (B)
DIVERSION BY-PASS AND AIR VENT ASSEMBLY (C)
RAW MILK INLET
FLOAT TANK
SUCTION LINE TO MILK PUMP RAW OR DIVERTED MILK
YORK PATENTED MILK DIVERSION & STARTING ASSEMBLY

Simplified, better, faster overall operation by means of our patented milk diversion and starting assembly is available to you with York High-Temperature—Short-Time Pasteurizers. This compact arrangement includes these features:

A. STARTER VALVE—A three-way sanitary valve located directly below the flow diversion valve and utilized, when starting up the system with water, to dispel the water to the atmosphere, allowing milk to be available in the float tank for immediate use without the making-up of any broken connections.

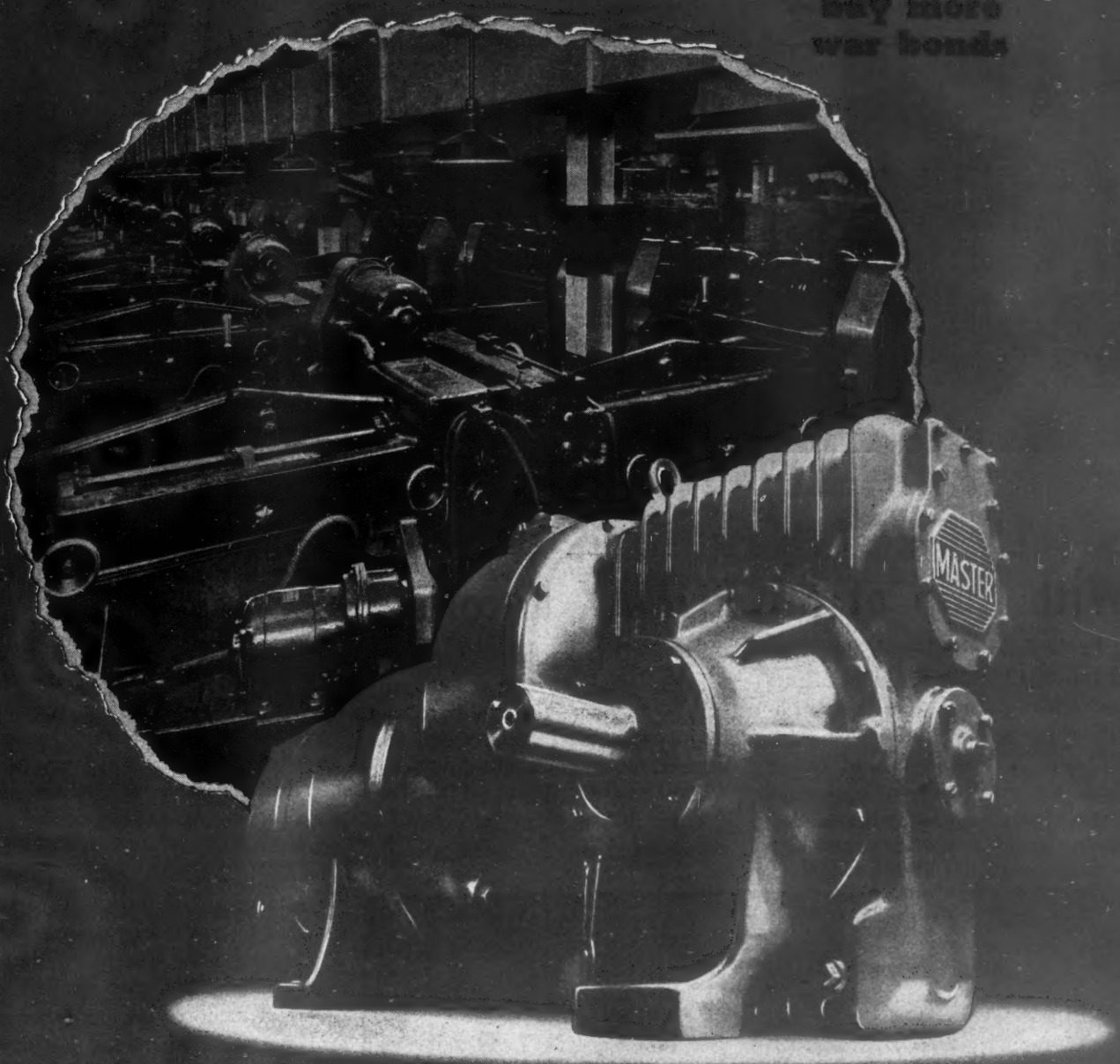
B. ORIFICE FITTING—Machined to provide during diversion of milk an equal pressure drop to that encountered when milk is in forward flow. This is important if holding time is to be kept to a minimum, a necessity for maximum cream-line. Without this feature the milk pump tends to speed-up as pressure is reduced and thus the pipe line holder must be of length to handle the rated capacity at the reduced head. It is usual practice with Health Officials to check holding time at both forward and diverted flow.

C. DIVERSION BY-PASS AND AIR VENT ASSEMBLY—This assembly allows hot diverted milk to go directly into the milk pump suction line reducing the time of diversion to only a fraction of that encountered when milk is diverted into the float tank and mixed with cold milk in that tank. Note that during diversion preheating through regeneration is not available necessitating the heating section of the pasteurizer to handle the full heating load during that period. This feature is made possible by the air vent (upper connection on the float tank.) Without this vent considerable trouble through air-hammer in the pump and pipe lines is encountered, even to a point of breakage of pipe lines and fittings. York Corporation York, Pennsylvania.

YORK REFRIGERATION AND AIR CONDITIONING FOR WAR

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

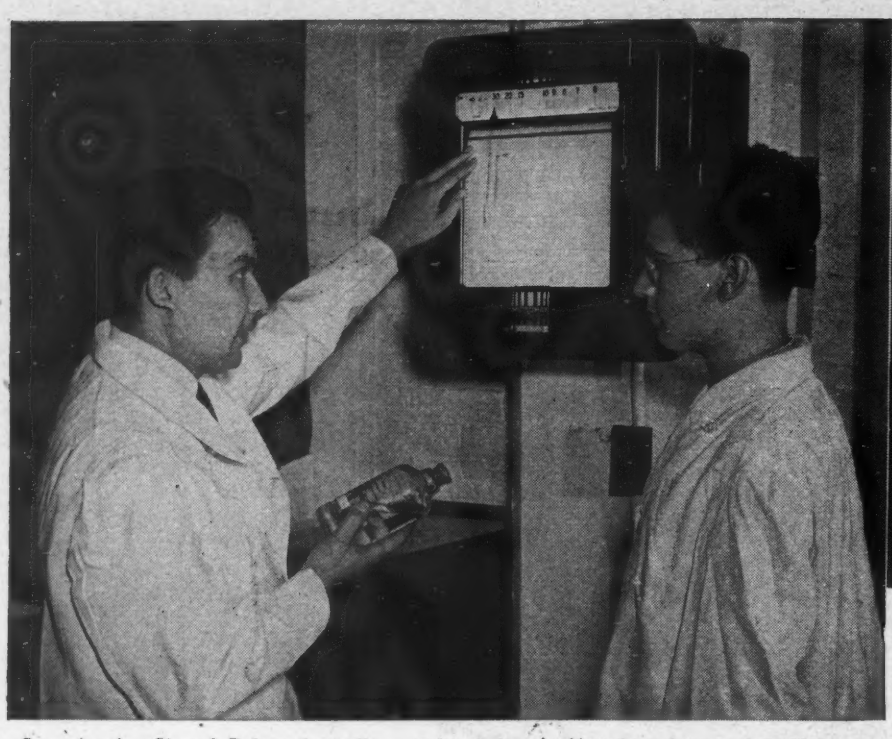
buy more war bonds



STILL THE ALL-AMERICAN FIRST

Year after year, Master gearhead motors demonstrate their popularity and dependability with more millions of hours of satisfactory service in the field than all the other makes . . . COMBINED.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



Supervisor in a Sharp & Dohme plant tells an assistant that watching the resistance of distilled water, on the Micromax Recorder, is a necessary first step in preparing "pyrogen-free" water for bottling.

Preparing an injection of blood plasma; 250 cc of double-distilled "pyrogen-free," sterilized water from a sealed bottle is added to an equal amount of "Lyovac" (dried) normal human plasma. The result is the marvelously effective life-saving fluid, initiated by you who give your blood to the Red Cross.

STILLS PRODUCE PURER WATER With Help of MICROMAX Recorder

In the daily distilling of thousands of gallons of water for blood-plasma and other pharmaceutical use, technicians in the big Philadelphia plant of Sharp & Dohme Inc. of course check the water's purity in various ways which most businesses neither use nor need.

But S&D make at least one check which is useful wherever an automatic still is running—they measure and record the water's electrolytic resistance, as a guide to the proper operation of the still.

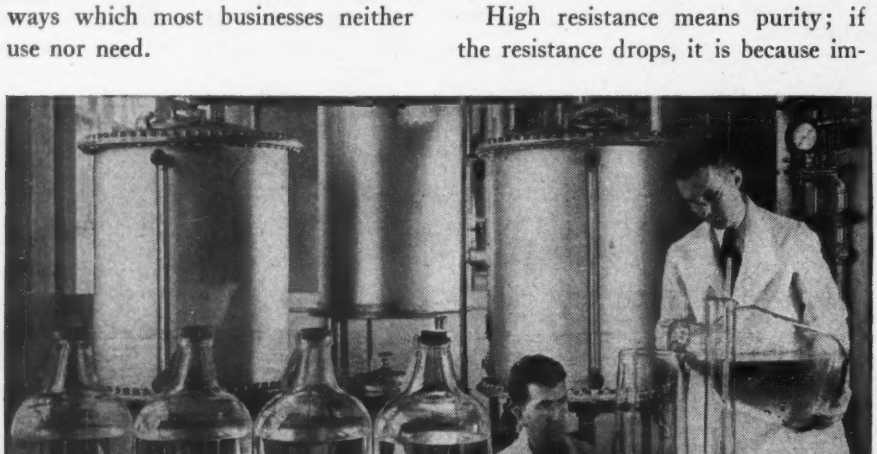
High resistance means purity; if the resistance drops, it is because impurity is appearing. Impurity may be due to running the still too hard, or to neglect in cleaning out its accumulated solids; or to any other condition which unbalances the still's operation. But, regardless of the cause, the result is impure water which may contaminate the larger supply and cause the rejection of the whole.

And so Sharp & Dohme guard against this by using sensitive, accurate Micromax Recorders which automatically and continuously show the resistance at all times, and draw a record for use in case questions arise.

In this particular plant, the still attendants watch the recorders as a part of their routine, but other users of the same Micromax instruments equip them to open a valve and automatically divert any impure distillate. The general practice is to use just one multiple point Micromax for an entire battery of stills.

This Micromax Recorder is a rugged, highly dependable instrument. If you need one, an L&N engineer will gladly help in its selection; or if you want a publication, ask for Catalog EN-95, free on request.

Jrl Ad N-95-702(1b)



Technicians at a battery of automatic stills in the Philadelphia plant of Sharp & Dome, Inc. The Micromax Recorder, above, continuously records electrolytic resistance of water en route to bottles, and warns if impurity appears.

V depends on me!

A Slogan For Every American

LEEDS & NORTHRUP COMPANY, 4912 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS • TELEMETERS • AUTOMATIC CONTROLS • HEAT-TREATING FURNACES

St. Regis PLAYS NO FAVORITES

YOUR Specific Requirements Decide the Selection

Come to ST. REGIS for specialized packaging assistance. There is no high pressure "stuffing the ballot box" in favor of any one method. Each of the three St. Regis Packaging Systems has demonstrated its efficiency and economy in packing and shipping the products for which it was designed. So in advising on packaging problems, St. Regis Packaging Engineers are free to recommend the system best suited to *your* individual product – and *your* production requirements.

Some Vote For VALVE PACK. Valve Pack is inevitably the choice of those requiring Maximum Production With Minimum Labor. St. Regis Automatic Packing Machines (Belt, Screw or Impeller type) speed production and save manpower by preweighing your product and propelling it into self-closing, valve type Multiwall Paper Bags. Gravity Type Packers are also available for filling Valve Bags.

Others Vote For SEWN PACK. Quantity users of open mouth bags select the St. Regis Sewn Pack System. Automatic sewing machines, applying a bound-over tape and filter cord, sew through all plies of the bag. Operators recommend this System for its swiftness and uniformly excellent closures.

Others Vote For TIED PACK. Tied Pack affords an economy closure for those with moderate or intermittent production. The St. Regis Wire Tied Pack System permits the efficient and quick closing of open mouth bags without automatic equipment. A hand twisting tool constitutes the entire equipment for effecting the securely tied closure around the neck of the bag.

For expert advice in selecting and installing the packaging system to fulfill your immediate – or future requirements, consult a St. Regis Packaging Engineer.

St. Regis Bags have 3 to 6 independent walls of tough kraft paper fabricated in tube form, one within the other, so each bears its share of the the load. Chemical and physical properties of product determine number and weight of kraft and special sheets.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION • THE VALVE BAG COMPANY

NEW YORK: 230 Park Avenue

CHICAGO: 230 No. Michigan Avenue

IN CANADA
BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, B. C.

Baltimore, Md. Birmingham, Ala. Dallas, Tex. Denver, Colo.
Los Angeles, Calif. New Orleans, La. Seattle, Wash.
Franklin, Va. Nazareth, Pa. San Francisco, Calif. Toledo, Ohio

IT'S GETTING ROUND TO INVENTORY TIME. WE OUGHT TO TAKE STOCK OF WHERE WE STAND

. . . AND THE PLACE TO BEGIN IS THIS PATCHED-UP PLANT. WE NEED A COMPLETE REFRIGERATION CHECK-UP. LET'S CALL IN WORTHINGTON.

Have YOU an Overworked Plant that Needs a Physical Check-up?

When there's food aplenty and all bans lifted, will you be ahead of competition with every economy planned and every product improvement safeguarded?

In your plant equipment ledger have you entered debits and credits against machine performance with overall plant efficiency in mind?

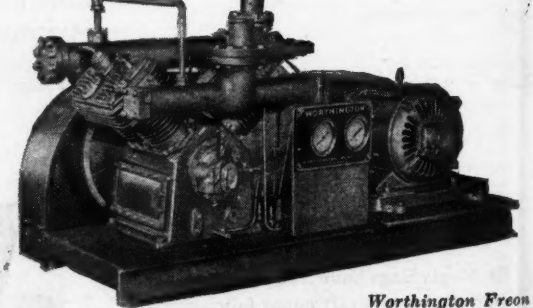
And have you given thought to replacing outmoded or worn-out machinery . . . expanding facilities for post-war business?

Yes, the time is at hand when an inventory should be taken—when the "Clearing House" of industry must make an accounting of individual plant preparedness. And refrigeration will be the core of the situation.

The double pressure of supplying food to our armed forces and meeting civilian needs has perhaps strained machinery beyond the endurance limit.

That's where Worthington's long experience and recent developments, applied *now* to a survey of your needs, would be of material advantage. Why not call our nearest office into consultation?

CA3-44



Worthington Freon Refrigeration Units are available in sizes to 50 H. P.—for cold storage, low temperature freezer duty, or for air conditioning.

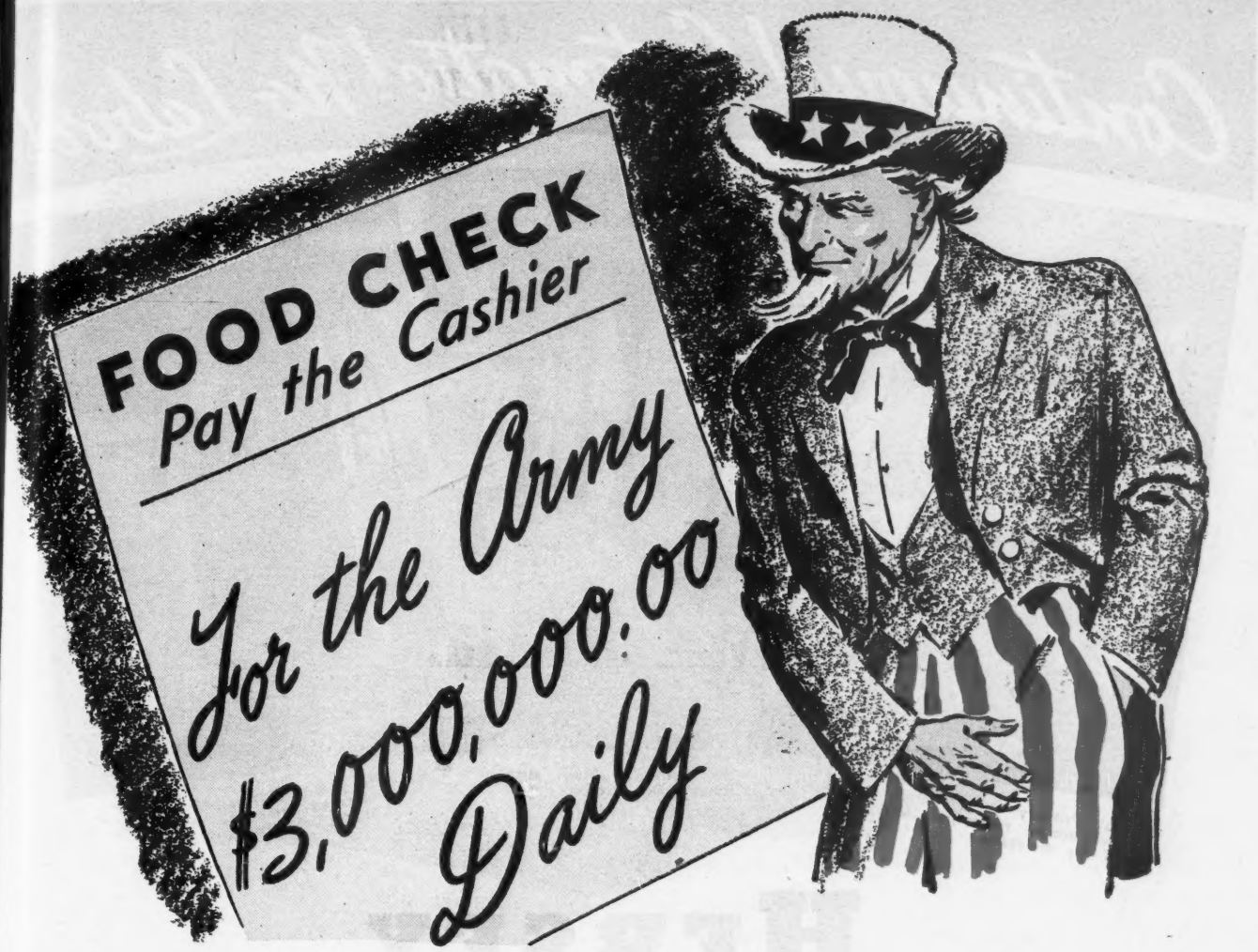
WORTHINGTON PUMP AND MACHINERY CORPORATION, HARRISON, N. J.

District Offices and Representatives in Principal Cities

WORTHINGTON

Refrigeration

AND AIR CONDITIONING



THE "EATS" ARE ON UNCLE SAM

Official sources recently revealed that over $3,000,000.00 is spent daily by the Army for food... outlay for the Navy, Marines, Coast Guard and lend-lease send the "check" skyrocketing. The nutrition and supply problem of war production forces at home is another major concern of our Government. Food-for-freedom is imperative! End results of America's all-out efforts to grow foods cannot be chanced . . . national recognition of positive protection during shipment and storage is imperative also. At Rhinelander Paper mills, we face these facts and are devoting 'round-the-clock endeavor and the experience of nearly a half century to supplying reliable food-protective papers, each grade world famous as the best of its kind.

RHINELANDER
PROTECTIVE PACKAGING
Papers

FROM THE BEST THAT'S MADE TO THE CHEAPEST THAT'S GOOD

Genuine Greaseproof	Cereal Wrapping Papers	Bakery Product Wraps	Wax Laminated Glassine
Coffee Bag Papers	Laminated Greaseproof Papers	Cracker Box Liners	Opaque Label & Bag Glassine
Confectionery Papers	Lard and Shortening Liners	Greaseproof Innerwraps	Packing Industry Wrappings

RHINELANDER PAPER COMPANY · MILLS AT RHINELANDER, WISCONSIN, U.S.A.

Continuous! Automatic! No Labor!

(a) Primary stage Hersey Dehydrator removing 66% of the moisture.

(b) Four finishing stage Hersey Dehydrator.

(c) Dried potatoes being discharged from a finishing stage Dehydrator.

HERSEY
VEGETABLE DEHYDRATOR

For potatoes, carrots, beets and all root vegetables

CONTINUOUS IN OPERATION taking the product in continuous flow from the last washer and discharging without further attention to the packaging room

COMPLETELY AUTOMATIC in movement of product, temperature control and cycle time NO OPERATORS NEEDED

UNIFORM TREATMENT because the product is in motion and is being turned over constantly Every particle receives exactly the same treatment

Constructed of

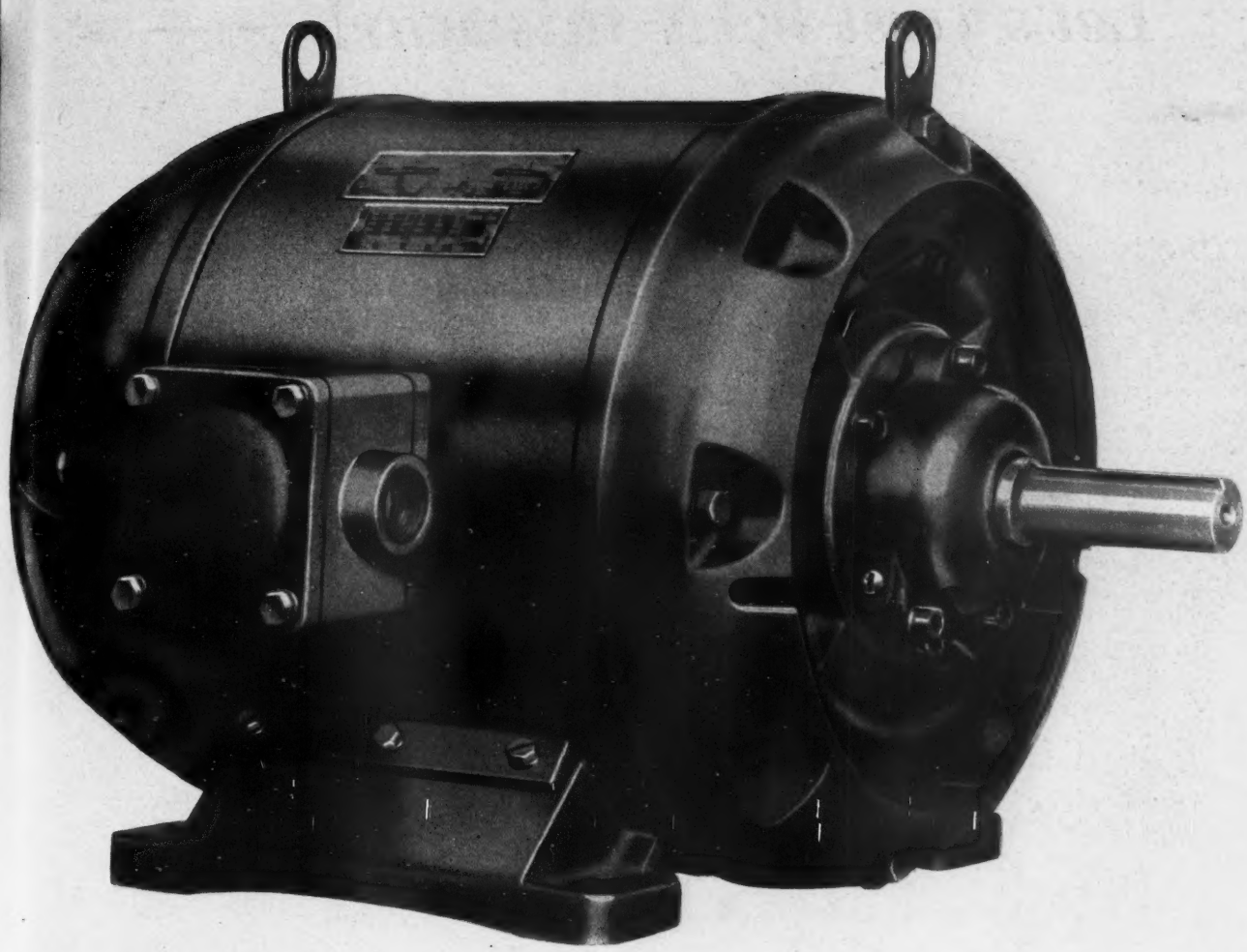
NON - STRATEGIC MATERIALS such as wood, cast iron, etc., wherever possible

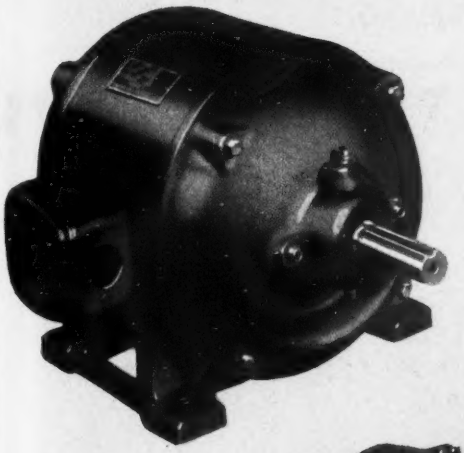
• ***Send for Catalog Today***

HERSEY MANUFACTURING CO.

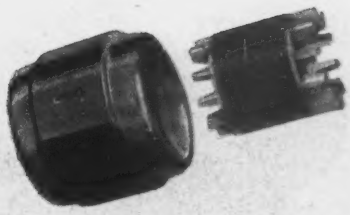
DRYING ENGINEERS FOR MORE THAN 60 YEARS

381 E STREET • SOUTH BOSTON, MASS.





There is a size and type LOUIS ALLIS electric motor for every industrial requirement.



THE LOUIS ALLIS CO., MILWAUKEE, WIS.

Let's first WIN this war!

We won't ever have a second chance—

The Gerjaps are waging a vicious determined war — a cruel fanatical war to kill, conquer and loot their foes — a war of no quarters and of no compromise — either we defeat them — or they will conquer us!

And unless WE win — neither we nor our children's children will ever have a second chance.

We here at Louis Allis are forcing our every effort in every way to help win this war — to get it over as quickly as possible.

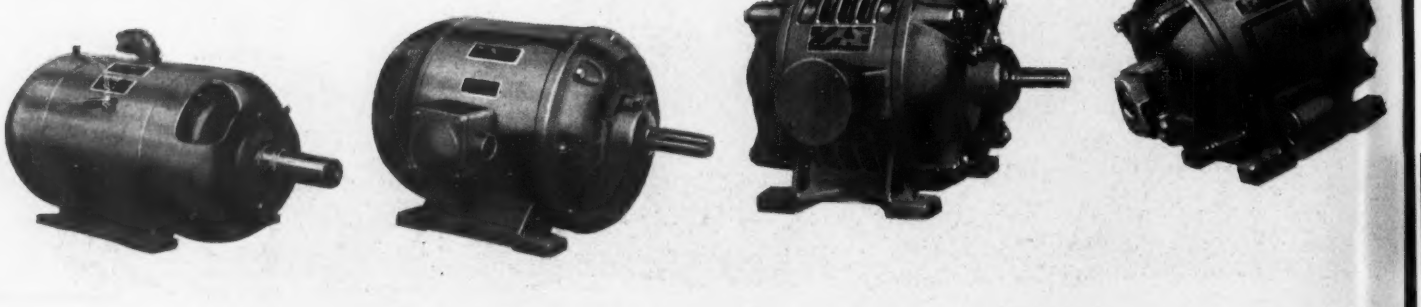
Our engineering development department has created many outstanding — perhaps revolutionary — improvements in electric motor design — construction and performance —

Motors that are serving a major important role in helping your boy and mine win this war — to help bring him back home — safely — as quickly as possible.

Many of these important new motor developments will also play an important role in the post war period.

But now is not the time to discuss them — let's first WIN this war!

THE LOUIS ALLIS CO., MILWAUKEE, WIS.



WORRYING

do a Master Job TO-DAY!

Another good thought passed on by

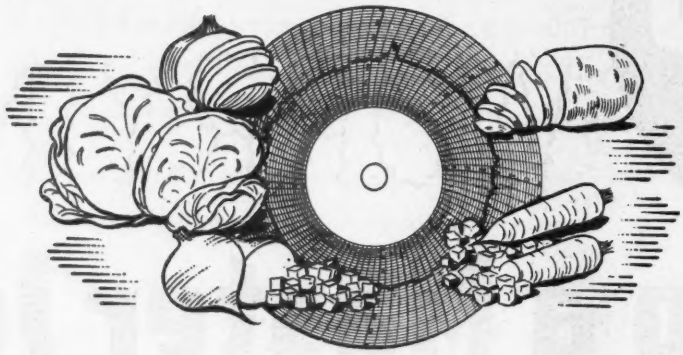
KVP

MAKERS OF

FOOD PROTECTION PAPERS

KALAMAZOO VEGETABLE PARCHMENT COMPANY
PARCHMENT · KALAMAZOO 99 · MICHIGAN
BRANCH PLANTS IN PHILADELPHIA, PA., AND HOUSTON, TEXAS

"YOU CAN'T DEHYDRATE 'EM BY GUESS AND BY GORRY"



Bristol's Automatic Controls Stop Spoilage, Increase Output, Save Fuel — Protect Color, Flavor, Vitamins — Insure Uniform Good Quality of Dehydrated Fruits and Vegetables.

Reports are still in the making, but this much about food dehydration is now clear. In successful, large-scale production, you've got to have the right *heat,* the right *moisture,* the right *air speed,* at the right *time,* for the right *volume* — or else!

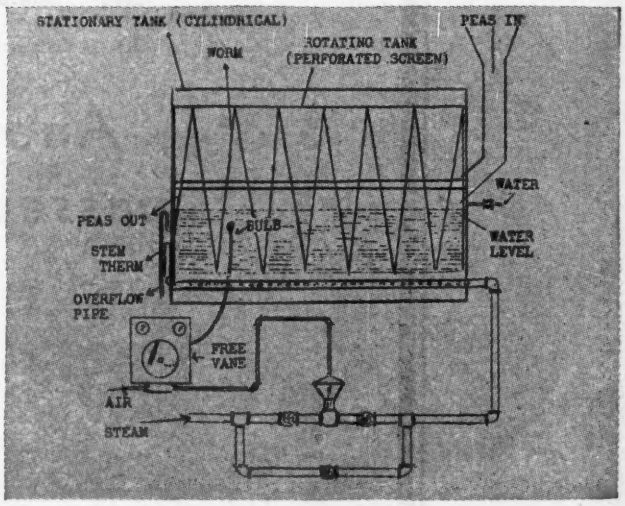
In blanching alone, where volume is apt to vary per batch of product, where steam pressures vary as retort's are put in or out of service, or cooler lines are opened or closed, manual controls are almost certain to spoil a dangerous percentage of war-essential foodstuffs.

Even more so in dehydration proper, where only slight variations from correct temperatures threaten case hardening at the beginning, and scorching or partial destruction of quality at the end, it takes automatic controls to keep best procedures standard.

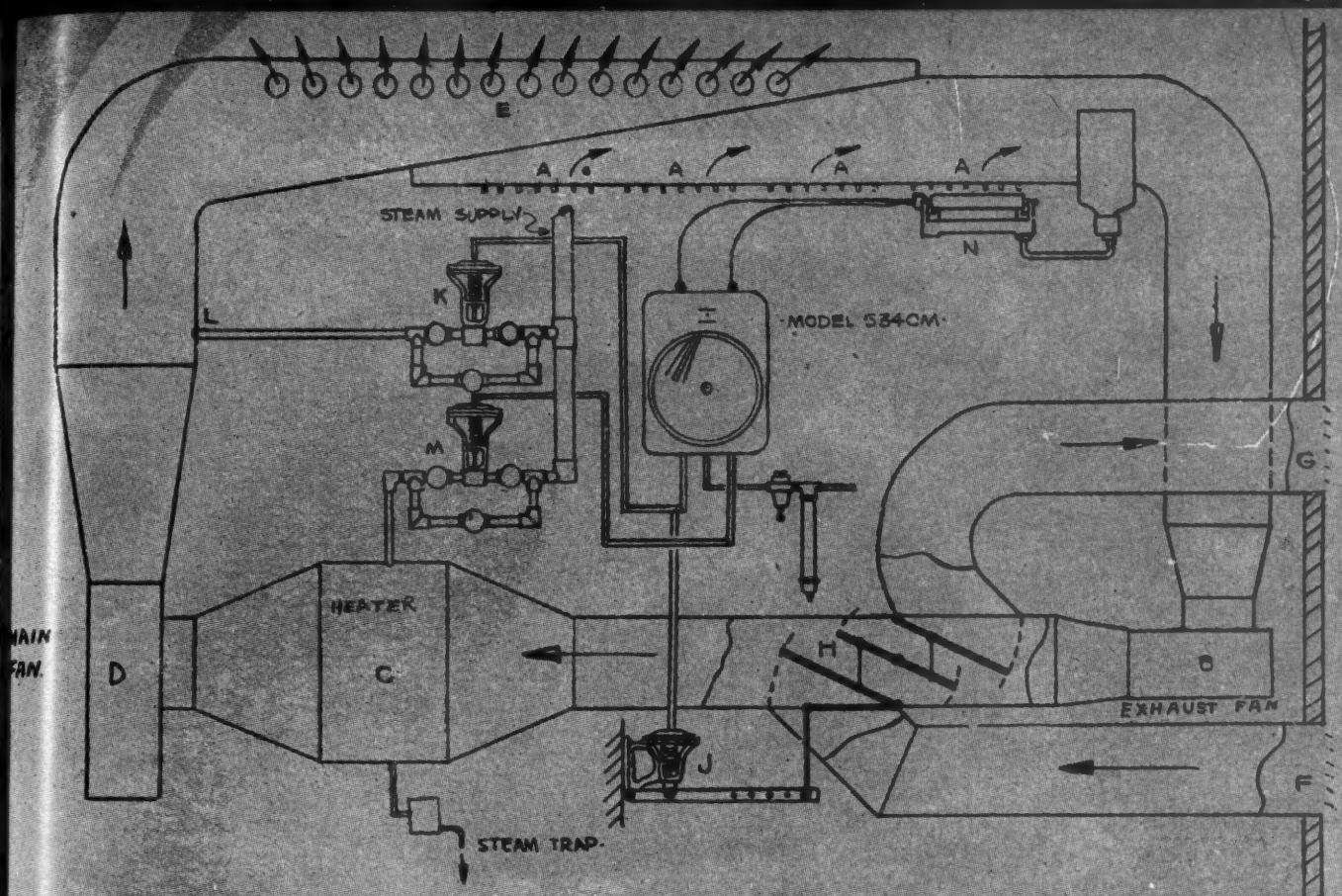
Whatever your dehydration method, Bristol engineers offer you the benefits of wide, practical experience in applying specific instruments to the control of temperature, relative humidity and air flow in food processes. Alert to dehydration developments, they are ready to place the latest, proven facts and figures at your disposal.

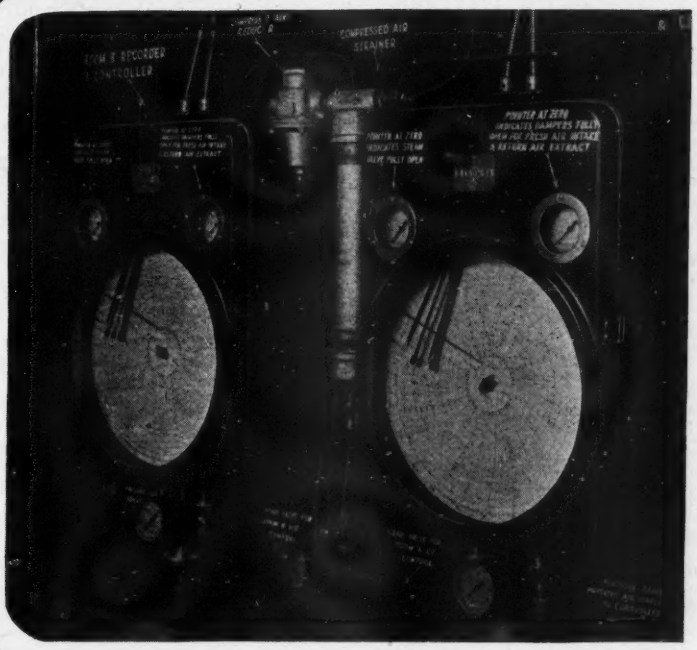
Bristol's Free Vane Temperature Controller on Rotary Blancher Prevents Boiling Over and Spoilage of the Product.

For this vegetable — peas — varying temperatures of 190° to 210°, depending upon batch size and hardness, had to be held from 2 to 10 minutes, in blanching before dehydration. Manual control meant constant watching and produced variations within each set of conditions that caused an overly soft or overly hard cook. Processor was also troubled by boiling over of the blancher. A standard Bristol Free Vane Temperature Controller operating a diaphragm valve in the steam line eliminated these difficulties, reduced spoilage and fuel costs.



THE BRISTOL COMPANY
Waterbury, Connecticut
The Bristol Co. of Canada, Ltd., Toronto, Ontario
Bristol's Instrument Co., Ltd., London N. W. 10, England





Bristol Installation Cuts Drying Time 50%, Insures Uniform Quality and Rate of Drying in Spite of the Weather

Drying time was reduced from 5 days to 2½ days when Bristol engineers devised complete automatic controls for this delicate dehydration process. Constant watching, constant manual adjustment to changing weather conditions, slowed down operations. Exact low temperatures, exact high humidities, were necessary to avoid case hardening, with gradual reversal of these conditions toward the end of the drying process.

On this process, charted above, Bristol engineers installed a Free Vane Wet & Dry Bulb Psychrometer Controller, recording on a 12" — 24 hr. chart, with Bristol Synchro Valve and Lever Motor for valve and damper control. Write for Bulletins A100. Address the Bristol Company, 115 Bristol Road, Waterbury, Connecticut.

BRISTOL

Engineers Process Control for Better Products and Profits

AUTOMATIC CONTROLLING AND RECORDING INSTRUMENTS

Looking ahead with Asbestos

"Leave it to that starter cartridge to do a job. A snap of the switch and the engine's *gotta* spin. Helps get a plane into the air—*sure*—when a split-second counts! Smart idea, that cartridge—and I understand one of the most important things in it is a small disk made of asbestos packing."

Right you are, Sergeant. That asbestos disk in the back of the cartridge directs the entire explosive action forward. What's more, it's K&M Asbestos Sheet Packing in 75% of all aircraft starter cartridges.

K&M is a name that a lot of airmen will remember when they go back to civilian jobs. They will know it stands for downright dependability. They will rely on it for better packing performance with air, steam, oil, water, acid or gas in the "V" years to come.

Emergency production for war has taught manufacturers many a lesson—and as with K&M, has pointed out the way to produce more, faster, with less. We have confidence that Industry will use this important lesson—aided by constant research—to help in building a better peacetime world

* * *

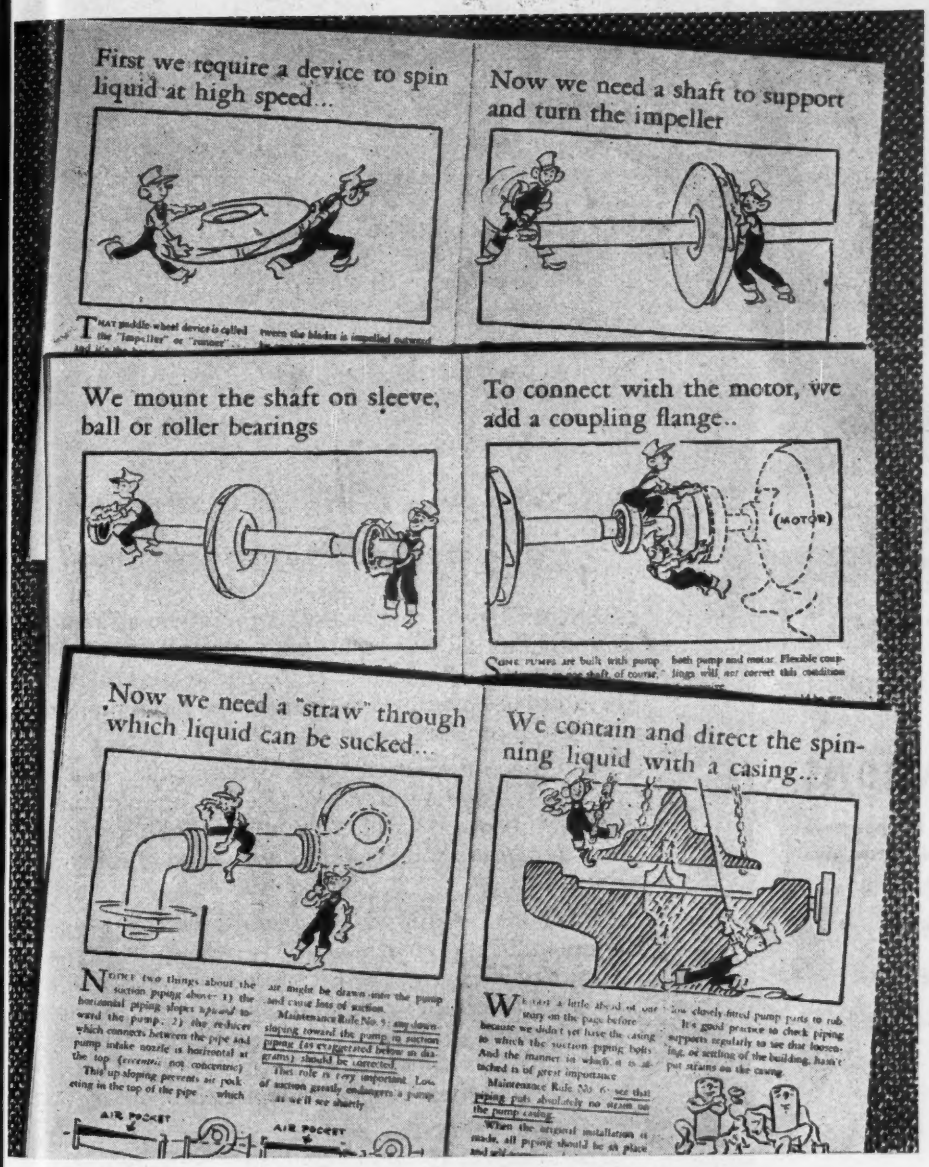
Nature made asbestos;
Keasbey & Mattison, America's asbestos pioneer,
has made it serve mankind . . . since 1873

KEASBEY & MATTISON
COMPANY, AMBLER, PENNSYLVANIA

Makers of

asbestos-cement shingles and wallboards; asbestos and magnesia insulations for pipes, boilers, furnaces; asbestos textiles; asbestos electrical materials; asbestos paper and millboard; asbestos marine insulations; asbestos acoustical material; asbestos packings; asbestos corrugated sheathing and flat lumbers; asbestos-cement pipe for water mains

Let's Build a Pump!


First we require a device to spin liquid at high speed...
Now we need a shaft to support and turn the impeller
We mount the shaft on sleeve, ball or roller bearings
To connect with the motor, we add a coupling flange..
(MOTOR)
Now we need a "straw" through which liquid can be sucked...
We contain and direct the spinning liquid with a casing...
AIR POCKET
AIR POCKET

When you do need new pumps — look into the extra efficiency, ruggedness and long life of Allis-Chalmers centrifugal pumps... the famous "Electrifugal"... and all types for every purpose.

ALLIS-CHALMERS
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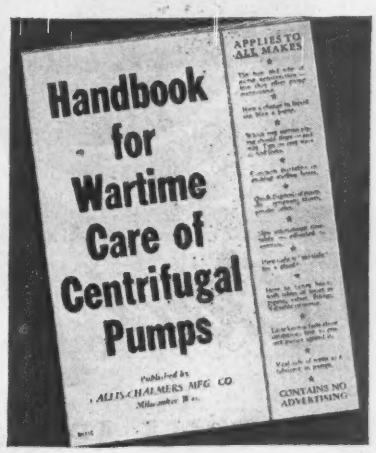
AC — WE WORK FOR VICTORY — WE PLAN FOR PEACE

A PUMP IS BUILT—STEP BY STEP—IN A-C'S NEW PUMP MAINTENANCE GUIDE. AS EACH NEW PART IS ADDED, WE SEE WHAT IT DOES, HOW IT DOES IT, HOW IT MUST BE CARED FOR.

WITH MOST PUMPS today doing *3 and 4 times* their normal work, they need the finer kind of care set forth in Allis-Chalmers' new "Handbook for Wartime Care of Centrifugal Pumps". Every executive, engineer and maintenance man should have a copy of this informative book in his technical library!



This book applies to *all* makes of pumps — contains no advertising! Contents include: new preventive maintenance tips; *war* timetable for pump care; valuable tables, etc. Tear out coupon and send in now for your *free* copy!

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Milwaukee 1, Wisconsin

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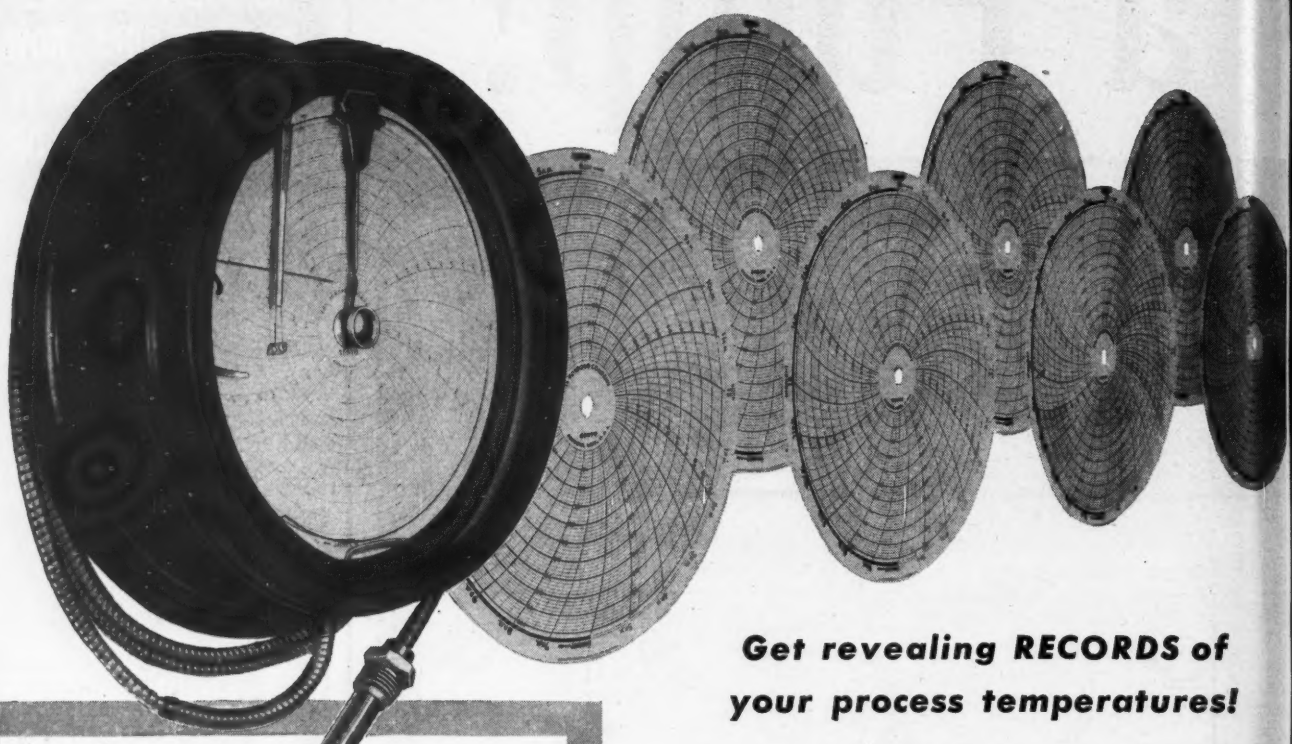
LEARN HIDDEN FACTS

about Your Production!



Get revealing RECORDS of your process temperatures!

Somewhere in your plant, is an unknown temperature fluctuation preventing high production efficiency from becoming *even higher?* The true facts about temperature often will reveal how entire plant production can be improved.

Get these important facts, continuously and inexpensively, by installing automatic temperature recorders at every critical point. *Get them accurately and dependably* by specifying Foxboro Temperature Recorders!

Foxboro Temperature Recorders are precision-engineered to meet toughest industrial needs for accuracy, endurance and trouble-freedom. Their ultra-sensitive thermal system reacts instantly to slightest temperature changes. Their light, strong recording mechanism "writes it down", day-in day-out for years, without attention except routine chart replacements!

Write for Bulletin 198-2 containing the full story of these automatic watchmen for your temperature operations. The Foxboro Company, 30 Neponset Ave., Foxboro, Mass., U. S. A. Branches in principal cities of United States and Canada.

Check

THESE APPLICATIONS

Here are just a few of the temperature points where Foxboro Recorders can give you valuable "inside" facts:

CANDY KETTLES
COFFEE ROASTERS
COOKERS
COOLERS
OVENS
RETORTS
SCALDING TANKS
SMOKEHOUSES
STORAGE ROOMS
VACUUM PANS

ARMY E NAVY

FOXBORO

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TEMPERATURE RECORDERS

Protection

Protection might be defined as something which prevents or minimizes any hazard to life or property. An anti-aircraft gun is protection to men.

The use of calcium chloride as a standard brine medium minimizes corrosion, prevents costly shutdown periods, saves repairs and carries a greater value of refrigeration — faster. It protects property.

Standardize on the standard brine medium, calcium chloride.

Write for our new Refrigeration Data Book. Ask for Bulletin No. 30. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.

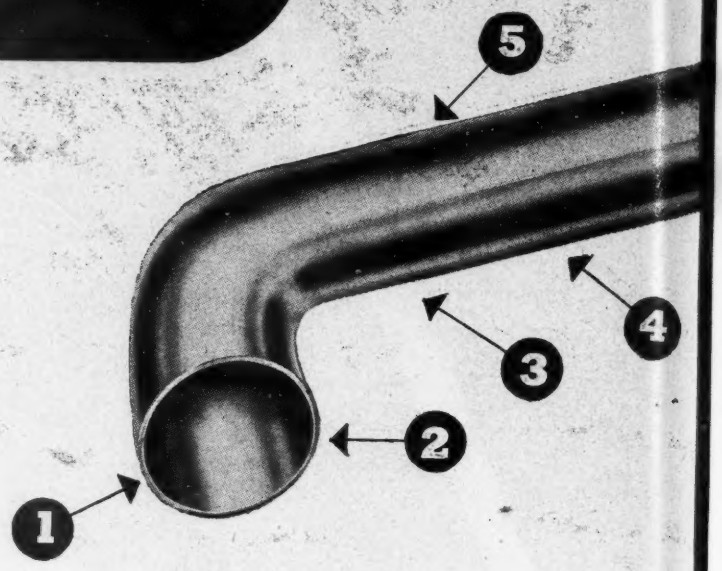
FOR DEPENDABLE REFRIGERATION

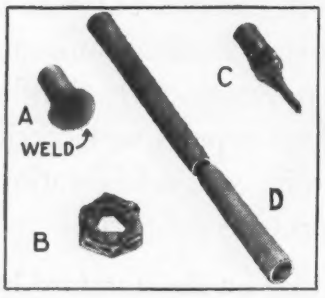
CALCIUM CHLORIDE

How these Uniform Tube Walls
help to Improve Products and Speed Production-

Welded Stainless Tubing . . . with uniform tube walls . . . was pioneered by Carpenter. And here are some of the ways in which Carpenter Welded Stainless Tubing can help you lick tough processing and fabricating problems:

1. **NO "THIN SPOTS"** to give corrosion or heat scale a foothold.
2. **LIGHTER GAUGES CAN BE USED** without sacrificing strength.
3. **MORE COMPACT ASSEMBLIES** possible with strong and uniform walls in lighter gauges.
4. **UNIFORM WALLS** mean *easier* bending, flanging, welding, etc.
5. **WEIGHT IS SAVED** by using less metal to sustain a given weight or pressure.





(A) FLARE TEST—Note that the break here is away from the weld.

(B) CRUSH TEST—This weld is strong enough to withstand the most severe fabricating operations. Note the even "fold."

(C) BENDING TEST—Even when a reverse bend was made along the weld this tube refused to break.

(D) TENSILE TEST—Note the uniform elongation and uniform break on this typical specimen.

Take advantage of Carpenter's diversified experience with processing problems involving the use of tubing. Get in touch with our Metallurgical Department when you need technical data—or when you could use fabricating help.

These Tests Double-Check the Strength and Uniformity of Carpenter Welded Stainless Tubing

Each lot of this tubing is subjected to hydrostatic pressure tests . . . and is given rigid tolerance, surface and straightness inspections. In addition, the sample tests shown here are made to double-check the strength of the weld.

At Your Fingertips . . .

Here is useful information to help you use Carpenter Welded Stainless Tubing to best advantage. A note on your company letterhead will bring you this data on physical properties, corrosion resistance qualities, sizes, special shapes, specialty tubing such as Inside Polished, etc. Ask for your free file folder today.

THE CARPENTER STEEL COMPANY
Welded Alloy Tube Division • Kenilworth, N. J.

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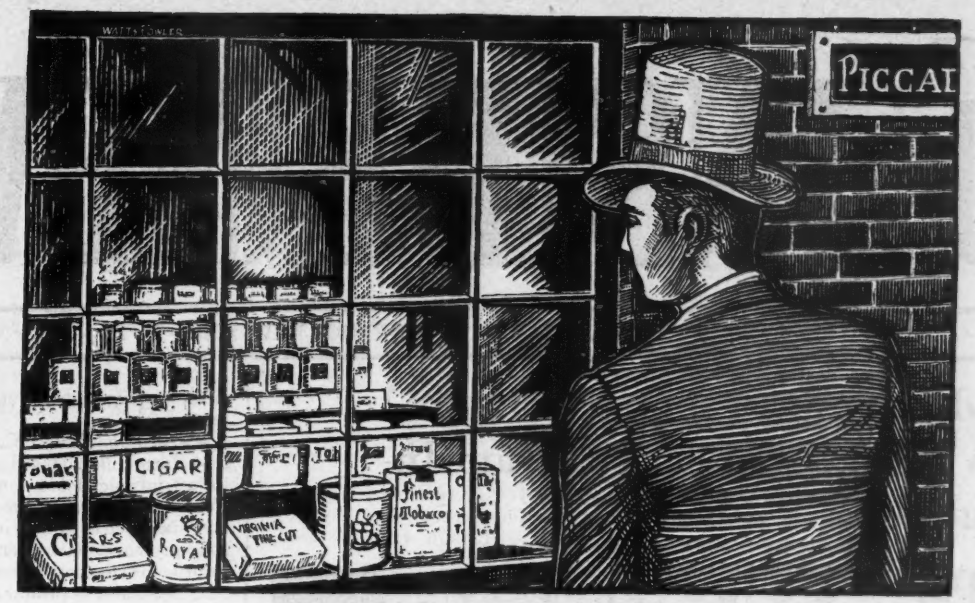
WELDED
STAINLESS TUBING



Richard Wright Took a Walk . .

Fifty years ago Richard Wright, while strolling along Piccadilly Circus in London, saw a package of machine-wrapped tobacco. Instantly, he visualized what this could mean to the tobacco industry of America.

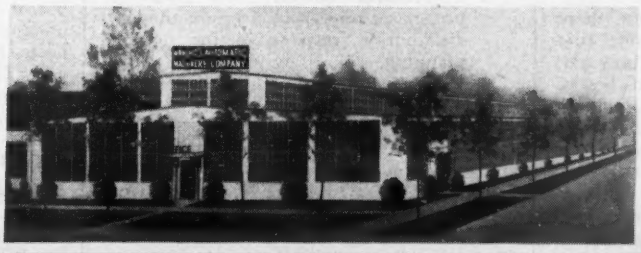
Wright hurried home, put his ideas into action, and the Wright's Automatic Machinery Company was born. Tobacco packaging in this country was revolutionized.

In the years that followed, refinements were made and new developments added that opened up opportunities in other fields. Up to 1941 Wright's Automatic Machinery Company was designing and manufacturing automatic packing, bagging, wrapping and labeling machinery for a growing list of companies in the food, liquor, tobacco and other industries.

Since 1941 Wright's Automatic Machinery Company has been supplying precision instruments to the United States Navy. This important experience will, one day soon, be expressed in terms of solving packaging problems for post-war marketing. Our engineers and designers are available now for consultation with firms interested in modern equipment for packaging, wrapping, labeling, stamping, or bagging, of their products.

ARMY E NAVY

~ 1893 - 1943 ~



Packaging Engineers

T. D. WRIGHT, *President*

R. H. WRIGHT, JR., *V. P. & Treas.*

WRIGHT'S AUTOMATIC MACHINERY COMPANY

DURHAM CABLE ADDRESS YONWRIGHT **NORTH CAROLINA, U. S. A.**

INSIDE NEWS

NOVEMBER PREPARED BY NATIONAL CAN CORPORATION, NEW YORK, N. Y. 1943

Food Industries In Unique Wartime Position Need Practical Program In Washington

Photo From U, S. Army

Eager hands of French children reach out for cans of condensed milk being distributed by an Army sergeant, member of the U. S. task force in Oran, Algeria. Half the milk ration of U. S. troops in Oran was given out in this manner. Allied forces have also made available a quantity of powdered milk to be distributed to children up to the age of fourteen in North Africa.

For many food manufacturers, the end of the war will be the beginning of full-scale "war production." Characteristic of food's special position is the fact that *while supply increases with the Navy's success, demand increases with the Army's success.* Military as well as humane reasons dictate need to feed liberated areas.

Federal controls and rationing are therefore expected to continue for some time irrespective of military decisions in any part of the world. The best that can be expected is a gradual increase of administrative efficiency and practical thinking in the alphabetic potpourri of agencies now in control of U. S. food supplies and prices.

With OPA, FDA, FPA, Army demands, Lend Lease demands and sundry long-range "win-the-peace" planners pulling and hauling before specific directives can be arrived at in many cases, prediction of short-term Federal activity is next to impossible.

The recent trend towards introducing experienced business brains into food administration, and the repeal of grade labeling requirements which had been written into maximum price regulations, are indications of possible improvement. Here's how, food men say, the Government should enter into the picture:

1. Government should determine overall national food needs.
2. Government should then hold the proper sections in food production and distribution responsible for detailed planning.
3. Government should then cooperate in seeing that the plan gets results . . . that regulations are really effective.

U. S. Food Notes: Government has been and is accumulating *a vitamin A stockpile* for use in liberated areas, also purchasing seeds in advance . . . Need to calm consumer buying by *increased imports from Latin America* is foreseen in certain quarters. In view of naval successes, only step required is positive request from War Food Administration for ships and space . . . *Feed for livestock and poultry* is now so reduced that large marketings may end meat shortage for several months, but cut egg supply.

World Food Notes: Canada is expected to have turned 7,500,000 bushels of wheat into industrial alcohol by the end of '43 . . . *New sorts of basic foodstuffs are taking hold in Africa* under impact of war. Africans are meeting current grain shortage by return to cassava starch and manioc root . . . Australia is producing 1,000,000 *cans of Australian-grown vegetables a week* for the services. Canning techniques there have been established with the help of American experts. 471

Gum Guaiac Not Used Extensively In Preserving Food For Armed Forces

Gum guaiac is being used by Swift & Company in the stabilization of certain fats and oils, particularly lard; fatty foods in paper wrappings, for instance, are stabilized in contact with the package. Gum guaiac in meat dehydration is still experimental, and is not being used in dehydration of fruits and vegetables. It is not being used in large-scale preservation of food for the armed forces, as stated in the July issue of *Inside News.* 472

Vitamins Made In Cheese

Cheese makes its own vitamins, investigators have discovered. Vitamins of the B complex appear to be synthesized and stored in the outer portions of certain cheeses during the curing period. The types of cheese tested were Camembert, Brie, Liederkranz and Limburger. 473

Spoilage-Free Foods Seen

Foods can be freed of the thermophilic, or heat-resisting bacteria that cause spoilage, in from 1½ to 2 minutes of treatment by a new process for which a patent has been filed. Details of the process, developed after a year of research work, will not be available until the patent has been granted, but it is claimed that the process is applicable to various foods such as sugar beets, beans, soybean flour and other products. The cost of the treatment is said to be extremely low. 474

Peavine Silage as Cattle Feed

Findings of an Agricultural Experiment Station should help pea canners allay the fears of any of their growers who may have believed that feeding of pea silage to cattle made the cattle susceptible to a disease which caused them to stagger and go down. 475

NATIONAL CAN

PLANTS: NEW YORK - BOSTON - BALTIMORE - CHICAGO - HAMILTON, OHIO - FORT WAYNE, INDIANA

Synthetic Rubber Putty

A new putty, in which man-made rubber entirely replaces natural crude rubber formerly used, is superior to the previous product, according to the nationally recognized manufacturer. At the present time it is employed chiefly for sealing metal joints in combat equipment, though diverse uses are suggested. 476

Oil Purifiers

Lubricating and heating oil reclaimers, with capacities ranging from two and one-half gallons in 70 to 90 minutes to 120 gallons in the same length of time, are available in 11 models and two series, both types using contact filtration in which common refinery earths, available on the open market, are used. These reclaimers are recommended for restoring all types of used oils, including drained oils, from a wide range of installations.

The machines are said to be capable of reclaiming used oils without presettling or pretreatment and restoring the oils to substantially the same values of fire, flash, viscosity, color, neutralization number and precipitation number as the new parent oil. Operated under thermostatic control, they permit the man working the machine to do so incident to his regular duties.

Of potential value to organizations having their own fleet of trucks and motor cars, as well as to plant and manufacturing processes of companies. 477

Aerosol "Bombs"

A new insecticide concentrate has just been patented by a Bureau of the United States Department of Agriculture. At the present time, the Armed Forces are taking the entire output of these aerosol bombs, which are being made commercially by four companies. The concentrate is contained in a steel cylinder, which acts both as a container and a dispenser, a valve serving to release the insecticide in the form of a fine mist or fog. Because droplets of insecticide dispersed into the air in this way are much smaller than those dispersed by the usual sprayer, they have been proved to be more toxic to insects. 478

Pest Damage Needs Control

Total annual damage to our food supply through the attacks of insects and rodents runs to approximately two billion dollars. The estimated loss is approximately six to seven per cent of our total available food or about the amount we lend-leased to all our allies last year. Pest control through intelligent and repeated use of insecticides is thus more important than ever as a wartime necessity. A list of 10 leading insects from standpoint of the damage they cause is available. 479

Technical Topics

TEXTILE PRESERVATIVE — Waterproofing and rot-proofing of textiles has been seriously studied in Australia to meet moist, high temperatures. Copper compounds, applied in hot impregnation, using copper-soap emulsions or mixtures of emulsions of copper soaps and suitable waxes, have proved most effective. 480

FISH INCREASE—Foreign experiments in a fishing community show that fish can be multiplied as much as ten times by the addition of certain compounds and phosphates to the water in a manner similar to the fertilization of land. 481

GARMENTS FROM OCEAN—Among the many products Britain expects to manufacture in a new postwar industry using seaweed is an inexpensive fabric. 482

INFECTION AVOIDED — Australian process for sucking eggs from their shells for dehydration without the pulp touching the outer shell, or contact with hands, claims complete safety from infection. From 100,000 to 1,000,000 bacteria and 200 to 500 mould spores tests show on the outer surface of an average clean egg. 483

PINE NEEDLES—A vitamin valuable in the daily human diet has been discovered in research on pine needles by Russian scientists. 484

INVISIBLE RAINCOAT—An invisible raincoat is formed on cloth, paper and other materials by exposing them to chemical vapors which make them waterproof. The "raincoat" is so thin, its structure cannot be determined by chemical analysis or seen under a high-powered microscope. 485

JOJOBA—Experiments in growing jojoba bush under irrigation near Florence, Arizona, is an expansion of the commercial use of this bush which grows in semi-arid regions of Mexico and has been a new source of wealth for this country. 486

DEAD SEA SALTS—Palestine's new industry is producing chemical salts evaporated from the Dead Sea, in open evaporation pans by a new secret process, it is announced. 487

"ROTTEN CABBAGE"—Odors for detection are not new. Peppermint has been used to find a leak in pipe lines. Now the United States Bureau of Mines advises mine owners to use a chemical which smells like rotten cabbage, as a warning to miners to leave a dangerous level. 488

SODIUM CELLULOSATE—Has been introduced in Britain for use as a thickening, emulsifying, demulcent, glossing and starching agent. The material does not itself ferment, and is resistant to fungal and bacterial growths, it is declared. 489

FLUE DUST—Iodine and potassium chloride recovery from blast furnace flue dust has been advocated in Germany. 490

SODIUM METAL—Is now being used as a coolant in the exhaust valves of aircraft engines. 491

PROPYL GALLATE—Was suggested recently in Britain as a suitable agent for inhibiting the autoxidation of animal and vegetable oils. The material was found to be soluble in oils at relatively low temperatures, and to apparently have a low degree of toxicity. 492

FORMIC ACID—Can be synthesized directly and in high yield by the action of carbon monoxide on water vapor in the presence of certain catalysts, according to a recent article in German technical literature. 493

ANEMIA AID—The injection of red blood cell suspensions produced favorable results in anemic patients, in recent investigations by three physicians in the United States Medical Corps. Beneficial results were reported in 44 of the 48 test cases on which the report was based. 494

CUPROUS CYANIDE—Production by a simplified method was recently described in a British technical journal. The new method was declared to produce a material much lighter in color than by older methods, which is of especial advantage in making cuprocyanide solutions for use in the Sandmeyer reaction for preparing aromatic nitriles. 495

DEHYDRATION—The results of research on nutrient losses in manufacture and preparation of dehydrated vegetables indicates that these products should be used only in soups or stews and that all soaking and cooking waters should be made a part of the soup or stew, according to the authors of a recent paper. 496

VITAMINS IN SUGAR—Whole mature sugar cane is a fair source of thiamin and riboflavin, rich in pantothenic acid and a good source of niacin, according to findings reported recently. 497

Every effort will be made to furnish additional information on these articles. Where such information is not obtainable, we will refer inquiries to the original source of the article. Write to National Can Corporation, 110 East 42nd Street, New York City. Please mention the number at end of article—also name of the magazine you saw it in.

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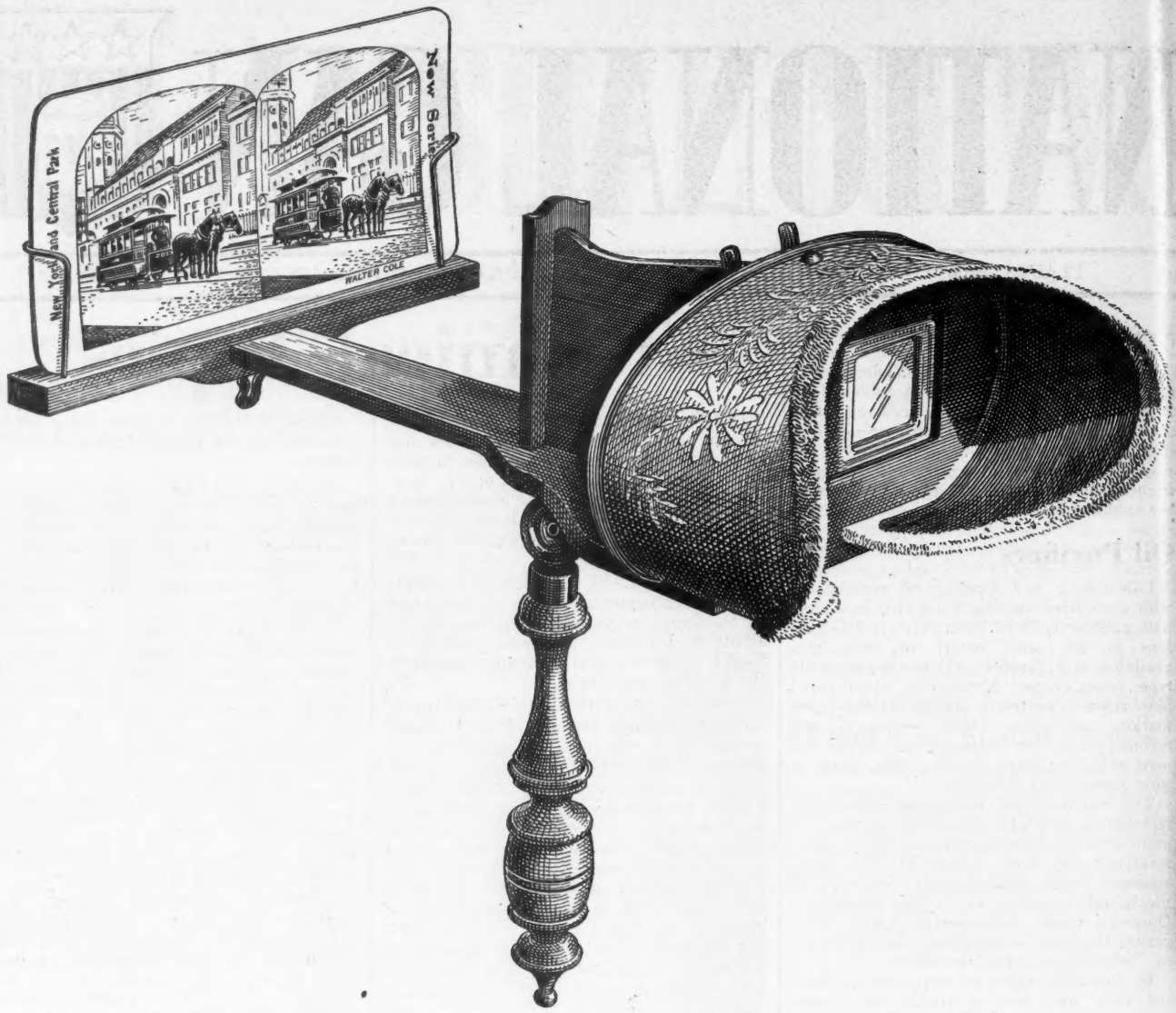


THIS? A WAR WEAPON?

Remember the old-fashioned stereoscope — grandfather's substitute for the movies? Remember how it made pictures stand out in three-dimensional relief?

Well, the same idea is being used in stereoscopic airplane cameras today. Because stereoscopic pictures show up hidden depressions and hills that are not always apparent in the usual aerial photograph.

Grinding stereoscopic lenses, in fact, *all* highly-corrected lenses, is a delicate precision operation. In order to insure accurate measurements and to avoid uncontrolled expansion, lenses are tested in special *air conditioned* rooms . . . maintaining a constant temperature at all times.

Air conditioning is used similarly in making the famous Norden bombsight, in precision machining, and in many other industrial processes.

To do exacting war jobs like these, General Electric engineers have developed dependable air conditioning and industrial refrigeration equipment—equipment that had to be more efficient, more compact, and more flexible.

In the post-war period, the public will be enabled to buy not only new—but vastly improved air conditioning—from General Electric.

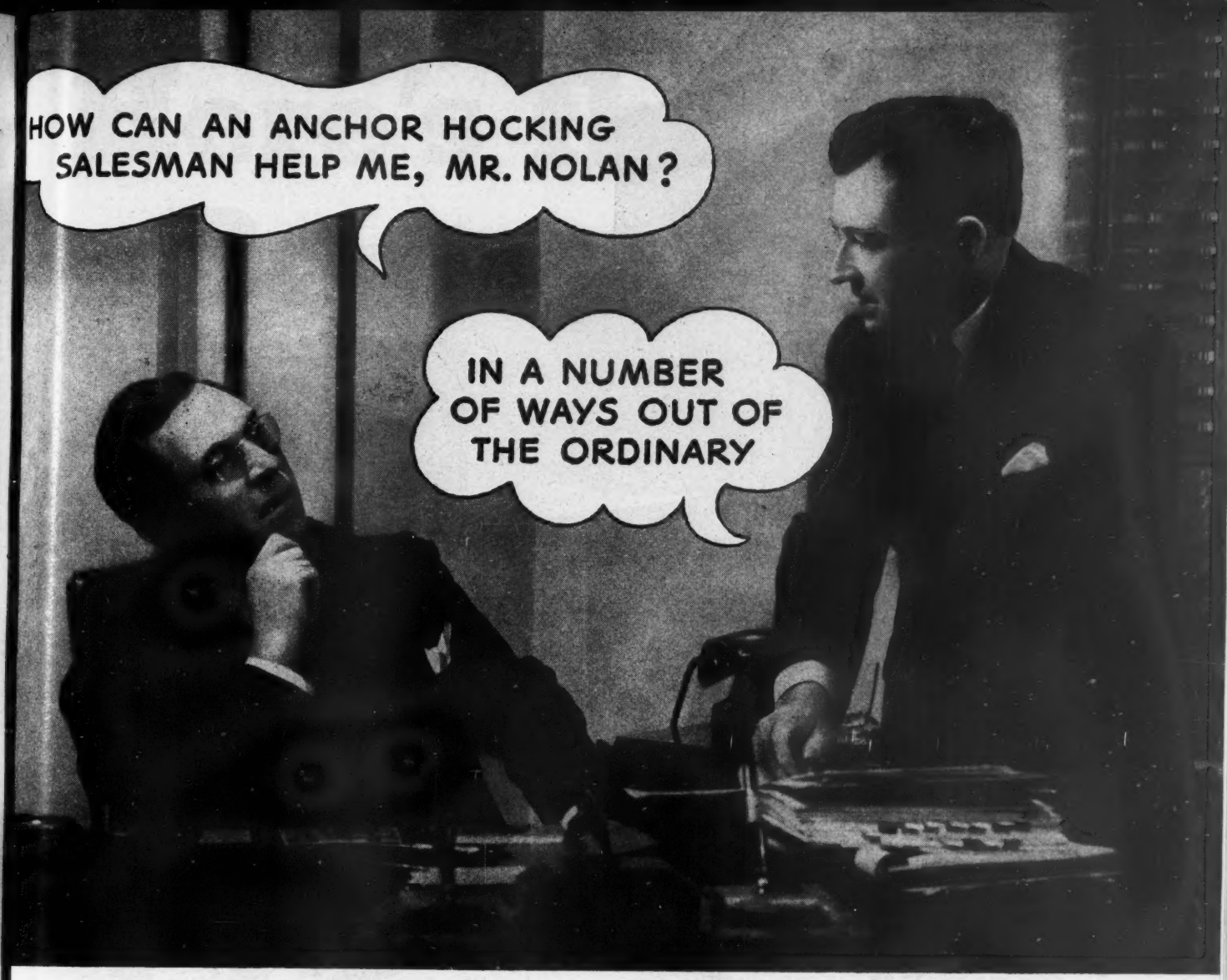
☆ BUY WAR BONDS ☆

General Electric Co., Air Conditioning and Commercial Refrigeration Divisions, Section 4310, Bloomfield, New Jersey.

Air Conditioning by

GENERAL ELECTRIC

Hear the General Electric Radio Programs: "THE HOUR OF CHARM," Sunday 10 P. M. EWT, NBC..."THE WORLD TODAY" News Every Weekday 6:45 P. M., EWT, CBS



Anchor Hocking salesmen know their glass containers, closures and sealing machines thoroughly. And because of the extent of their line, they are not prejudiced in favor of any one item, giving you only the counsel that is in your own best interest. They know filling, sealing, production... transportation problems, display and merchandising techniques—and costs. And they know these things—not in theory or out of a manual—but after years of daily contact with packers of a wide diversity of products. On many occasions they have rolled up their sleeves to help solve perplexing customer problems. And with all this, they give you in full measure the usual sales services you have a right to expect.

JOHN R. NOLAN, one of Anchor Hocking's ablest and most popular men, has been a member of the Anchor Hocking family for 18 years.

ANCHOR HOCKING

GLASS & CAPS

ANCHOR HOCKING GLASS CORPORATION · LANCASTER, OHIO

Dehydrated fruits and vegetables are America's answer to the food transportation problem. What has previously required 1,000 ships for transport is now being processed as dehydrated food and handled by as few as 125 bottoms.

But dry foods are particularly vulnerable to insect infestation. They must be protected. You can get the finest scientific protection by using Methyl Bromide—the penetrating fumigant. It reaches the very center of every bag, box or package. It does a complete job when properly applied—quickly, easily and inexpensively, without the slightest injury to the product. Write for free booklet, "Methyl Bromide Fumigations."

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METHYL BROMIDE

THE PENETRATING FUMIGANT

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

Here's the Pair to Beat WARTIME V-BELT Wear!

1 THE BEST BELTS . . .

You're off to a "flying start" against maintenance worries when you get Texrope Super-7's design-against-wear construction. You get: 1) 20% *more* cords than before; 2) Cords made 50% *stronger* by special Flexon process; 3) Cooler-running rubber cushion that "floats" cords around sheaves; 4) Duplex-Sealed cover that guards against grime. When you *do* need new V-belts *invest in the best* — Texrope Super-7!

2 THE BEST CARE . . .

You'll get a head start on longer V-belt life — regardless of what brand you use—by following valuable tips in Allis-Chalmers' *free* handbook: "Plain Facts on Wartime Care of Rubber V-Belts". Here is the full story of V-belt care . . . packed with a wealth of practical data . . . written so that new as well as experienced men will readily understand it. Contains no advertising. Tear off coupon and send for *free* copy today!

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TEXROPE* SUPER-7 V-BELTS

WE WORK FOR VICTORY — WE PLAN FOR PEACE

Trade mark registered U. S. Patent Office. Texrope Super-7 V-Belts are the result of the cooperative research and design genius of two great companies—Allis-Chalmers and B. F. Goodrich—and are sold exclusively by Allis-Chalmers. Available in all sizes.

ALLIS-CHALMERS MFG. CO.
Milwaukee, Wisconsin

Gentlemen:

Yes, I would like to receive free of charge a copy of your "Plain Facts on Wartime Care of V-Belts".

(Name)

(Title)

(Company)

(Street Address)

(City and State) A 1656-4

Seven lives saved by a four-pound can

"We had been looking for those men for many days—hour after hour, frantically searching—praying we would find them.

"Each succeeding day seemed more hopeless than the day before. Time was running out, *their time to live!* We had to find them soon!

"Suddenly we caught sight of a column of smoke curling upwards as though coming right out of the water! In a few minutes we *did* see them, huddled in their tiny raft, a mere speck bobbing up and down on the waves.

"We never would have found them if it hadn't been for that smoke signal!" (1)

★ ★ ★

Such accounts of rescued men are an inspiration to us at American Can Company. We are thankful that we are able to turn out the containers for daytime distress signals, with which life boats and rafts are equipped.

These distress signals require metal, as do blood-plasma containers and first-aid kits, also made at American Can. Metal is used, too, for containers for emergency field rations, and for cans to safeguard the fuel for life-raft stills that convert salt water into fresh water.

These products save American lives. We are thankful to be able to make them.

Other products coming off production lines of the American Can are complete torpedoes . . . artillery shell containers . . . TNT containers . . . demolition kits . . . land mines . . . hand grenades . . . and many others. It is our hope that each one of them will help to shorten the war.

As always, however, we are still very much in the business of making cans for food. Last year *more* food was packed in cans than ever before, a great percentage going to the army and navy.

For many civilian items, substitute containers must now be used in place of the customary can. We are making every effort at American Can to develop wartime containers suitable for every type of product.

(1) *This is a typical, not an actual, report.*

CONTRIBUTE YOUR BLOOD TO THE RED CROSS

As you read this advertisement—stop and think—your blood could save the life of a wounded American soldier! If you live in or near one of the 33 cities in which Red Cross blood-donor centers are located, call and make an appointment.

AMERICAN CAN COMPANY
230 PARK AVENUE • NEW YORK 17, N. Y.

Free Enterprise

WHAT IS IT? HOW DOES IT WORK?

☆

OURS is a free-enterprise economy the chief motivating forces of which are the prospective rewards for effort and risk-taking. Its smooth operation depends: first, on adequate incentives for risk-taking, innovation, and individual effort; and second, on sufficient competition to minimize the need for government regulation and to prevent artificially high prices or wages from being maintained in large segments of the economy. Trouble comes when these incentives and this competition are tampered with or removed.

America was founded by men who had the urge to better themselves and the courage to take a chance. These men uprooted themselves in Europe and braved the unknown. They risked all for freedom. They knew that, to be free, they had to attain economic freedom. Their goal was an economic freedom which permits the private ownership of property, the free choice of jobs, and free entry into entrepreneurial pursuits. Their efforts, therefore, were directed toward individual opportunity with no limit on individual achievement. Their foresight and the endeavors of those who followed them created the world's greatest industrial nation enjoying the highest standards of living.

We can take pride in the knowledge that our country has been the greatest single contributor to the world's physical assets even though we remember that an abundance of natural resources contributed materially to America's economic development. But the fact that our progress has been interrupted, again and again, by depressions which resulted in enormous wastes of our human and material resources is sobering proof that our economic mechanism still is far from perfect.

Our production per man-hour has been increasing at the rate of 2½% per year. Improved machines and greater efficiency have more than tripled the output per hour of work since 1900. Looking to the future, this annual rise indicates that our production per hour of work will double in the course of the next 25 to 30 years. This means that we can have twice our present volume of goods and services per capita or an equivalent combination of more production and more leisure. In other words, we can further increase the living standards and further decrease the working hours of the American people by further intensifying our industrial efficiency.

This is no idle dream. It can be achieved, and it will be achieved, if only we maintain the essential features of our system of individual enterprise which alone makes possible this near-utopian goal. Intensification of our efficiency, however, means that we can have full employment only if we expand enormously our production, and particularly our production of new goods. We can expand total production only if we have the markets and the demands for the vast output of goods and services made possible by our technological development. To attain these, we will need to venture into new markets, new inventions, and new methods. Such ventures involve risks, and risks will be taken only if there is sufficient prospect of reward.

Let us never lose sight of the fact that the essential features of free enterprise are the prospective rewards for risk-taking as well as for effort.

The evidence is clear that incentive methods of wage payments will boost production. Carefully devised systems of salary payment with large differential inducements for superior performance have been powerful means of raising the standards of managerial accomplishment.

Free enterprise cannot operate effectively unless the wage and salary system offers greater rewards for greater effort. Neither can it operate effectively unless the prospects for profit are sufficient to encourage the employment of resources which otherwise would be kept idle.

Unless the prospects of profit are superior to the prospects of loss, new ventures will not be undertaken and going concerns will not expand or continue long in business. When the hope for profits wanes, employment and production slump; when that hope revives, employment and production recover.

Business initiative must be given every possible in-

ducement in order that maximum employment may be achieved through private enterprise. This involves the removal and avoidance of restrictions on business by government, by labor, and by business itself.

Competition is the life-blood of the free enterprise system. Business and industry must rely upon efficiency rather than upon protection from competition for their survival.

Those government controls which were made necessary during the war by the magnitude of government demands for goods should be lifted at the earliest possible moment. As soon as the danger of inflation has receded, price controls must be removed and profit margins again left free to be determined by market forces. The excess profits tax must be repealed and the burden of other taxes on business profits greatly reduced. Tax laws should be revised so as to permit adequate rewards for assuming risks. The modernizing of anti-trust laws and their vigorous enforcement, not indiscriminate persecution, will be supported by all who really want free enterprise. Such measures will strengthen the incentives to expand old businesses and to start new ventures.

Grants of unlimited monopoly powers to labor unions which enable them, consciously or not, to sabotage the profit incentive in business must be withdrawn. Labor has certain legitimate rights; and in order to preserve them and its freedom, labor must come to realize that its best interests lie in a well functioning, self-disciplined competitive free-enterprise economy.

There must be evolved in the minds of business, labor, and the public a recognition of the need for private business enterprise and a realization that policies which throttle it are harmful not only to businessmen but to workers and consumers as well. Unless we achieve this understanding and avoid needless deterrents to business expansion, we are likely to pay for our folly in the destruction of our free enterprise system.

We cannot tolerate conditions in which special interest groups in business, labor, agriculture, or politics prevent free access to the market by would-be competitors. Such monopolizing of opportunities stifles progress and creates profits or wage rates based on artificial scarcity. In such cases government interference to open the market to all comers is clearly indicated. We must recognize the need for constructive policies by business, labor, and government which will insure the competition necessary for the successful operation of our economy.

Increased government regulation and control of business activities is not conducive to strengthening the virility of private enterprise. Government ownership and operation of productive resources certainly is not to be condoned. The more government rules and regulates business, the less will be the incentive to assume risks and to exercise individual initiative. Government regulation of the detailed operation of industry inhibits progress, is prey to political pressures, and is subject to the human failings of its administrators. *Better far the rough guidance and justice of vigorous, though somewhat imperfect, competition than the uncertainty of arbitrary regulation.*

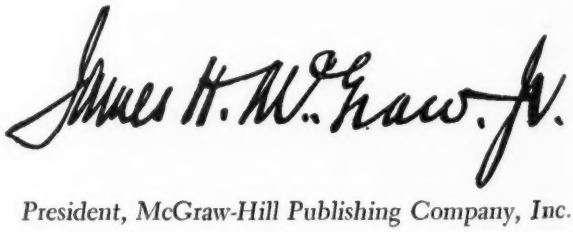
The gravest threats to our competitive system exist in legalized monopolies, such as the N.R.A. once comprised, such as the labor unions and farm groups have recently achieved, such as businessmen themselves have sometimes sought. The power of labor monopolies to encroach on business profits will tend to interfere seriously with the needed flow of new investment. And when any group is strong enough to move the average level of costs as much as the labor groups and the farm groups are able to do, there is good reason to fear that, when we begin to approach high levels of employment and production in time of peace, these groups will induce a price-wage spiral which will waste money incomes on price increases instead of permitting them to draw unemployed resources into production. While the demands of labor for collective bargaining rights and the demands of farmers for protection against the rigors of depression have validity, there can be no reason for excessive grants of power and privilege which threaten to make our system of free enterprise unworkable.

Ours is a complex economic structure. The functions which prices, income, savings, investments, and taxes play in this system are difficult to comprehend.

As I have said before: Thinking is hard work, and we will have to work hard if we are to develop business policies, labor policies, and government policies which will insure full employment and the opportunity for consistent profit. Yet only through such policies can we guarantee that private enterprise will be the predominant source of jobs, income, and production.

Even more difficult than thinking, and more important, is the implementation of many policies that are in the interest of the free enterprise system. Not all measures will satisfy all people. Special interests will have to be subordinated to the total interests of the nation. Sacrifice and vision have been essential to the winning of the war. They will be no less essential to the winning of the peace.

If we can gain recognition of the crucial role of incentives for enterprise, if we stand squarely for competition and against protection or privilege for special interests, and if we bend our efforts to find satisfactory ways and means to prevent large-scale unemployment, we can have the full benefits which only a free enterprise system can produce—in industrial progress, in improved standards of living, and in the preservation of our democratic ways of life.



President, McGraw-Hill Publishing Company, Inc.

FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

LAURENCE V. BURTON, Editor

NOVEMBER, 1943

Postwar Planning—IV

Your Part in Getting Ready for Research

A good research department is going to be an indispensable asset to every food company in the years following the war. All the signs point in that direction. But, very few executives have a clear cut idea of research, of how to utilize the services of a research department or of how to make research pay dividends. Generally speaking, the few who do understand this tool of accelerated progress are either in large companies or in rapidly growing small concerns. I regret to say, however, that even some of the large companies do not understand the proper use of a research department. Some of the big fellows achieved their present stature in another day. Their continuation as important size factors cannot be attributed to subsequent technological innovations of their own creation. Mere corporate size does not insure understanding of the place and function of research, nor will it insure freedom from future competition by concerns who understand and utilize research.

To understand why this is true, every top executive should take a little time off now and then, get far away from his business cares, and try to see things from the long-range perspective that is not possible at his own desk. Then he will realize that, with every nation on earth talking about a new world order—even fighting for it—when peace finally comes there are going to be a lot of changes from the older ways of doing business. He must inevitably come to the conclusion that being tough in a business sense will not be as successful in coping with business problems in the future as it has been in the past.

Research Substitutes for Toughness

In the postwar period, the results of successful research will be far more productive of net profits to a food company than strong-arm methods. I believe this because I am confident that there will be more rather than fewer restraints and controls on the conduct of business as the years roll by. Any realistic appraisal of the trends of the past fifteen years will reveal this to anyone with half an eye.

To meet these newer problems, research properly conducted, and continuously and aggressively pursued, will provide important remedies. Not only will it provide an offset to the problems and expense created by further social legislation which the public may be counted on to demand, it will also provide many a basis for an aggressive forward move with new or better products, or lowered manufacturing costs.

Unfortunately, however, research demands as much of the top executives as it does of the research department. To install a research department is not as simple as renting a safety deposit box, or hiring a nurse or physician to look after the health of employees, or installing a repair shop—all of which are for the purpose of keeping things as they were.

On the contrary, research is for the purpose of doing exactly the opposite—creating change, doing something new and different.

Executive Backing Needed

You, as a top executive, can hire a man to do something new and different, but unless you are sincerely back of him and unless you yourself are honestly seeking something new and better, the research man will become discouraged and the program may be terrifically handicapped. It may even fail through your own lukewarmness. Therefore, planning for research in the postwar period must begin with the top men, now. If research is something outside your own experience, your own part in the administration of a research program must be studied. A couple of years of preparation by the top executives, thinking about what they expect of research and how much they expect to cooperate with a research department, is none too long.

Several facts must be faced: (1) There are not enough good research men to go around, even if the armed services should release all the research men who are now in uniform. (2) The mere fact that a man has a college education does not endow him with the creative brain needed for successful research. (3) A man does not acquire inventive genius through a good education, though if he already possesses this quality a good education helps materially. (4) Furthermore, putting a white coat on a

man, giving him a place to work and dubbing him "Doc" does not alone create a research department.

Management that has had no previous experience in handling a research department has a lot to learn—just as much as the new research man who has been invited to join the organization. Management's part in a postwar research program must be studied now. To start after the shooting is over may be too late. There are certain things that only management can do. Management has the obligation to figure out what it needs in order to be successful. It's like drawing one card to fill an inside straight in a poker game—you know exactly what you need to have a strong hand. In a sense, research is the effort to find the card you need to fill out your business hand. If you can grasp this simile, you will realize why the business executive must accept the responsibility of figuring out what the business needs before the research man is hired to find it for him.

Competition for research men is going to be very keen in the postwar period, according to all the signs. The demand will be far greater than the supply. Competent researchers will be chiefly interested in firms which have a clear concept of what they want to accomplish in a research way. Salaries alone are not enough. You have only two or three years in which to prepare yourself.

L. V. Burton EDITOR

The Talk of the Industry

• MODERN American milk pasteurizing equipment in Palestine is so efficient, according to a friend who has recently lived there, that a dealer never changed his bottle caps printed in Arabic. Asked why, he averred that pasteurization kept the milk forever —why change caps which nobody would read anyway?

• AN alleged shortage of cigarettes is predicted for 1944. Wonder if Lucky Strike will reverse its one-time

slogan and urge "Reach for a Sweet instead of a Lucky"?

• FOOD BROKERS from all the states swarmed to the West Coast canneries with orders to buy unlimited quantities in late August, but got no more goods than if they had stayed home and written their requests.

•IT is very confusing to learn that we are to be allowed more gas, and not to be allowed more. That new tires are just around the corner, and that new tires are still a long time away. But this confusion is not confined to gas, fuel oil or rubber. In Washington recently we learned that tin conservation, salvage and smelting had been instrumental in increasing the nation's stockpile of this critical metal by X,000 tons in the past twelve months. What bothers us now is the alleged WPB-sponsored movement to organize the wholesale grocers of the country to pick up used tin cans for salvage on the ground that tin is so scarce "that there is talk of further curtailing preservation of foods in tin." And also that the Bureau of Agricultural Economics is so agitated over the forthcoming tin shortage that it recently issued a lengthy report advocating the conversion of ice cream plants to quick freezing, as a means of preserving foods that may soon be driven out of cans.

•THE OPA ruling that "tie in" sales —sales where an item not wanted must be purchased in order to get the one desired—are prohibited has received support in certain of the Federal courts, though it has not, so far as we are aware, been adjudicated. The commonest complaint from merchants is that nonrationed foods or low point values must be purchased in order to get the rationed food—for example, forcing the purchase of eggs in order to get meat.

But a new sort of incident came up recently in Pennsylvania. Because of the extremely short apple crop, cider vinegar has been scarce. A dealer in vinegars asked his trade to help stretch the cider vinegar supply by buying equal quantities of distilled vinegar and using them together. To which OPA has taken exception on the ground that it is a tie-in sale. The dealer's rejoinder was that there is hardly a quarter enough vinegar to go around and that his action was for the public good. Yet OPA will have none of it.

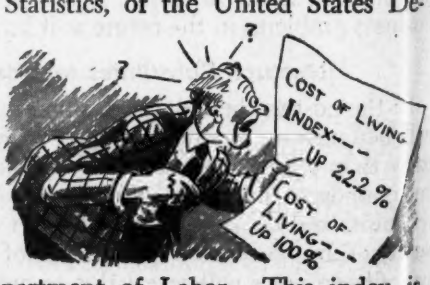
•A CALLER at this office in late September unburdened himself about many problems in the Pacific Northwestern States, ending on this complaint:

"What are we going to do for cold storage space to carry our frozen food production? Every warehouse is full of government butter. There never was so much butter in storage in our section as there is today. We are up against it to find freezer storage space for our production."

Apropos of the foregoing report it is interesting to note that the Army has announced it has enough butter on hand to carry through to next spring. Army buying of butter will be resumed in March, 1944.

Cockeyed Index Of Cost of Living

Something is decidedly cockeyed with the Index of the Cost of Living as put out by the Bureau of Labor Statistics, of the United States De-



partment of Labor. This index is used as the basis of many official pronouncements from OPA, WLB and others about the manner in which

prices have been held down. It is also used as the basis for calculating permitted wage increases based on the "Little Steel Formula."

Recently, Fred Vinson, Director of Economic Stabilization, pontificated about the way the cost of living had been held. Prices were up only 12 percent in the first nineteen months of war as compared to 29.5 percent in 1917–1918, he reported on October 1. Also he said that the Cost of Living Index had risen only 22.2 percent since January, 1941, compared to almost a 50 percent increase from 1914 to 1918.

What he has said may be wholly true relative to the index itself, but what does the index really mean? A friend living in Washington who keeps accurate household accounts says that his actual cost of living in Washington has increased almost exactly 100 percent since the war began. And anybody who is supporting a family can testify from his own experience that the cost of living elsewhere has gone up far higher than the 22 percent figure.

Organized labor has also been doing a little investigating on its own account and has collected what is probably as accurate a cross section of retail food prices as exist. The procedure is to collect the advertisements of chain stores which tell the prices of foods in a large number of cities. As one labor leader puts it, "Our people buy foods, not indexes. The advertised price is what we have to pay to eat. The B.L.S. index of the cost of living is so far from the facts that it is not even funny."

If the War Labor Board is trying to adjudicate wage increases on the basis of the BLS index and Labor is going on the "uncorrected" actual prices paid out for food, it is easy to see why there is so much agitation and strife. There is something strange—even cockeyed—about the whole matter of the index of the cost of living.

Visit the Chemical Show

Despite the war, the Chemical Industries Exposition will be held this year—at Madison Square Garden, from December 6 to 11, in New York City. While there may not be as much equipment on display as in previous years, the number of exhibitors will be sufficient to justify any production man in the food processing industry in spending half a day or an evening at the show.

One should plan to talk at length with exhibitors. This appears to be a likely possibility because most of the young men who normally surge through the aisles are now in the armed services. Conversation will reveal the postwar possibilities of new and improved technics that you will want to consider in connection with your own future plans.

The future trend in processing of foods will be toward continuous processes. Since these are not yet standardized, the food manufacturer must take the initiative and create his own designs and construct the plant out of the various parts that will carry out each unit operation in a continuous manner. To that end one's thinking should be directed in visiting the Chemical Show.

Role of Heavy Metals In Quality Control

A new finding regarding the role of heavy metals in the control of quality of processed foods, suggested by Dr. A. K. Balls, of the Western Regional Laboratory, at the June meeting of the Institute of Food Technologists, deserves reemphasis here. He has found that the presence of traces of heavy metals in vegetable or fruit, or in its wash water, is associated with more rapid loss of quality after dehydration than where still less amounts of the metals are found. He cautiously suggests that the selection of varieties of fruits and vegetables that are low in heavy metals or the use of wash waters that are similarly low in heavy metals, may some day prove to be an important method of minimizing quality deterioration.

When as fundamental a thinker as A. K. Balls makes such a suggestion, it merits everyone's serious and earnest consideration, whether the food undergoes processing by canning, freezing, pasturizing or dehydration. Admittedly, when dehydration is the preservative process the food is more vulnerable to deterioration today than by other processes, but this very fact may afford the clue to new methods of improving quality of all our foods.

There may be a parallel here with the experiences of epidemiologists, who generally find that the more rapid the onset of symptoms of contagious disease, the easier it is to discover successful control methods. It is the very slow and insidious dis-

Hors d'Oeuvres

• *Many people are finding carp and other coarse fish more palatable when prepared as fishburgers. It's amazing what you can cover up with a bun.*

• Best news headline of the year: "Jam of Cattle in Stockyards Greatest Since 1926."

• *OPA is sometimes indisputably right, as in the 2,500 word opus on cabbage seed where it says that "cabbage seed (Brassica capitata) is the seed used to grow cabbages."*

• To fill a gap left by students who returned to school this fall, 37 salesmen from a Midwestern canning company are helping to can the fall fruits. So both the students and the salesmen are getting an education.

• *The large production of dehydrated carrots and sweet potatoes has made these foods available for use by bakers, restaurants, hotels and other institutions. Now we'll see if the dehydrated foods of World War II really have what it takes.*

• Soybeans are a wonderful food, and their present substitution for meat is highly commendible. But when it comes to soybean frankfurters, you have a dog that is all bark and no bite.

• *WFA offers for sale out-of-condition rolled oats, also damaged evaporated milk and dry beans. If food prices keep going up there will be a real market for these bargain-basement comestibles.*

• The British navy sticks to rum, the American navy sticks to whiskey and the Italian navy stuck to port. As for the German and Japanese navies—glub glub.

• *WFA estimates that enough food is wasted on the home front to feed the military forces and meet Lend-Lease needs. Which means that we can hit the Axis with our garbage cans —if we keep them empty.*

• They tell us that after the war, ultra short wave radio may be used to cook steaks. If the steaks are no bigger than they are now, it would have to be ultra short wave or it would miss the steak altogether.

• *Table salt thrown on the fire helps to burn the soot out of the furnace and make it more efficient. Looks like the John Lewis coal shortage has provided a big new market for one branch of the food industry.*

F.K.L.

eases that are extremely difficult to trace from their origin to an active, recognizable illness.

Well-informed food technologists have known for years that heavy metals, such as copper or iron, in amounts from 15 parts per million down to less than 1 part per million, are important enemies of flavor, and sometimes of color. Dr. Balls has given us a possible theory of their mode of action where dehydration is involved. His theory deserves careful study and tests, and one may look forward to important new specifications for raw materials, water and equipment if his observations and suggestions are translatable into industrial operations. (His complete paper will be found in the 1943 *Proceedings of the Institute of Food Technologists.*)

Use Care In "Robbing" Formulas

ON THE MARKET are many foods, both liquid and plastic, the manufacturers of which are often completely unaware of the scientific mechanism that contributes uniformity of quality, of physical condition and keeping power. The older the history of a product, the more unlikely it is that such technical knowledge is in existence. For, after all, if a product has a 20-year or older history without spoilage outbreaks there has been no economic need to discover what makes it keep.

We now are in a period when scarcity of materials is an incentive to "rob" formulas — modify them in every possible way that will save materials. There is nothing morally reprehensible about such an effort—the reprehensibility, if any, exists in the field of economics and distribution and consumer acceptance—but any effort to meet shortage problems that does not study the bacteriological and chemical phases that also must be considered is nothing short of business suicide.

It is regrettable that many a business man in the food field has little comprehension of anything but dollar values, and often regards food technology as something for the other fellow but not for himself. It is important to proceed with caution in modifying formulas, especially of liquid and plastic foods.

Sugars are not the only ingredients that exert important self-preservative effects. Some of the other items are salt, acids (vinegar or acetic acid differs in its effect from other food acids), pH, and even certain scarce spices, especially cinnamon and cassia. The preservative principle of the latter is cinnamic aldehyde, and conceivably a formula might be near enough to the ragged edge to permit spoilage if its amount were notably reduced.

Today's problems must not be aggravated by any ill-considered formula modifications. An error in this direction may cost a firm its entire capital.

Neat Trick in Quality Control

Preventing insect infestation of a dehydrated vegetable-noodle soup was quite a job recently until it was discovered that the insects were the common flour weevil (Tribolium). Even though the plant which mixed and packaged the soups was immaculate, the bugs continued to be a pest in old stock in the trade. Finally it was found that the noodles themselves carried a few eggs of the weevil, enough to insure that an occasional package would become wormy after a few months. Ultimately the problem was solved by treating the flour from which the noodles were made in a far-away factory by a mechanical process that destroyed all eggs. This procedure plus insect-proof packaging eliminated all trouble.

Man Power Situation Grows Acute

GENERAL HERSHEY'S salty Hoosier humor must help him a great deal in his thankless task of administering Selective Service. As he once put it, his organization has "full operational freedom, without limitation, in the area between the immovable object (the will of Congress and the limited number of men of military age) and the irresistible force (the needs of the armed services).

Aside from the grim humor of his position, there is a serious aspect, serious alike to the military success of the nation and to industry itself. The Army is about 90 percent built: the Navy only 60 to 70 percent built. More men are needed now, 700,000 of them. Already the Army has taken in 10,000,000 men and has rejected 3,000,000 and discharged 1,000,000.

The previously rejected group include a sizeable percentage that have something wrong above their necks. Well over a half-million of them suffer from mental disease, are mentally deficient or are neurological cases—which is not to mention the 400,000 illiterate. If the Army accepted the rejects, many of them would become public charges from now on.

Now we begin to see why Selective Service must begin to draw on the father group, of which there are about 6,000,000 who have an average age of 31 compared to the average age of 24 in the army.

Selective Service expects to get 1,000,000 men from the father group. War Manpower Commission, which has the problem of dividing the manpower of the country between the armed services and the essential industries, confirms the SS expectation, but adds that fathers must be drafted unless war industry is raided for its key men.

WMC also calls attention to the Constitution, which says that all men up to the age of 64 are subject to service in the militia. Furthermore, WMC has the job of getting help to the war plants, most of which, in the aircraft industry, are behind schedule and short of help.

The time is fast approaching when a national service law will be needed. Such a Bill has been written and is ready to submit to Congress.

What does it all mean? It means that food plants are going to lose more men, and perhaps some women, either to war plants or to the armed services. There is no other way out.

Prudent and forehanded management will begin to review the situation now and have additional understudies in the process of training to take bigger responsibilities in 1944.

Do You Want Our Annual Index?

With paper rationing increasingly severe, FOOD INDUSTRIES must conserve still more paper. To accomplish this we propose to stop binding the Annual Index into the December number.

Those who bind their annual volumes will, of course, need the Annual Index, but to get it you will have to write to this office and order it before November 15, 1943.

We figure we can save 104,000 pages of paper by omitting the Index. Those who want it will be provided one free copy if they order before printing time.

Dehydrator Uses New Technics

The Simplot plant was built by man unhampered by knowledge of what he couldn't do. So he introduced some better methods

By L. V. BURTON
Editor of "Food Industries"

THE largest potato and onion dehydration operation in the country is that of J. R. Simplot, Caldwell, Idaho. This plant turns out in excess of 80,000 lb. of dried, diced potatoes per 24-hour day, consuming approximately 375 tons of raw potatoes and operating three 8-hour shifts daily, seven days a week.

Jack Simplot, who is only 33 years old, has been—and still is—a produce dealer. He ships approximately 5,000 cars of fresh potatoes and onions annually and operates 18 warehouses requiring 500 employees. The "sideline" of dehydration, which now occupies most of his attention, employs 1,000 men and women, making his produce dealing a secondary part of his business. In addition to these activities, he farms several hundred acres of potatoes and onions and contracts for the production of several thousand more acres of these products.

Began on Onions

Three years ago, Mr. Simplot was one of several backers of a California dehydration enterprise. But he didn't like the outlook. The plant was not satisfactorily located to obtain raw material. It did not have adequate sewage facilities. It was located too close to a residential district—onions have an aroma! So Mr. Simplot searched for and found the ideal spot for his own plant at Caldwell, Idaho, in the heart of an Idaho potato and onion producing area. Here, in 1941, he built his original plant—intended for onion dehydration only at that time—and unhampered by knowledge of what he *couldn't* do, went ahead in a big way, hired the best talent he could find, and began onion-drying operations with eight drying tunnels of the largest size. Sokol & Co., Chicago, contracted for his output.

Since then, Uncle Sam has become Simplot's only customer, requiring dehydrated potatoes as well as onions, and making greater and greater demands for increased production that have kept the Simplot plant in a continuous process of experimenting, testing and expanding. The eight original drying tunnels have grown to 30. Potatoes have become the principal product, although onions are still processed. Mechanical and operational features of the plant have been changed many times to improve the product, lessen waste and increase output.

Jack Simplot, owner, builder, general manager and idea man of J. R. Simplot enterprises.

Mr. Simplot admits that he may have a huge white elephant on his hands when government demand ceases, but he has ideas about how to meet that problem when the time comes. In the meantime, if the government wants still greater production of dehydrated potatoes or onions, all he asks is priority ratings high enough to get the equipment; he will do all the rest.

As might be surmised, his associates have to step fast to keep up with him, and any one who thinks small, lacks imagination or can't keep up the terrific pace and push hard all the time—well, he steps out.

Until recently, no visitor was allowed to see his plant, but now that he has established a sound reputation with his only customer, Uncle Sam, he has permitted the editor of FOOD INDUSTRIES to discuss his operations, withholding only a very few minor features of his own invention. The entire potato operation is a common-sense, straightforward application of engineering to a food-preservation process. Of particular help has been the fact that many of his staff have had long experience in handling potatoes and produce packing-house machinery.

From the accompanying floor plan and flow diagram it will be observed that while the sequence of operations in general is the same that similar plants would employ on this product, the start is radically different.

Handling and Washing

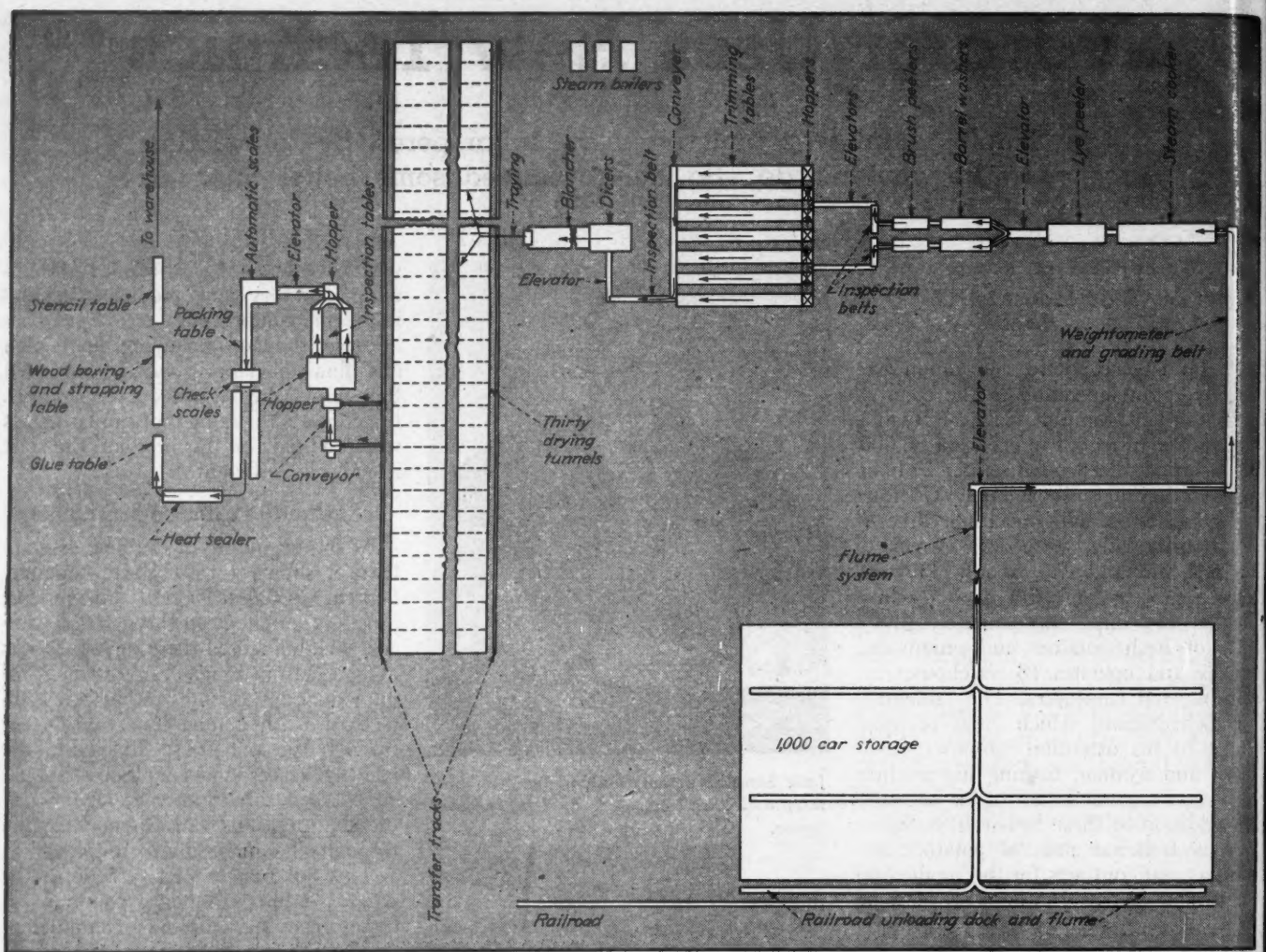
At the beginning of the flow diagram there is shown a 150x150-ft., concrete-floored, 1,000-car potato storage. All processed potatoes go through this storage, whether stored there or not. Stocks unloaded from freight cars or trucks for immediate processing are emptied directly into a hydraulic flume and floated through the warehouse directly to the plant. Potatoes stored in the warehouse are washed into flume laterals by hydraulic pressure and thence floated through the main flume to plant.

This flotation process, unique in the potato industry though common in tomato canning, employs a recirculation pump with an approximate capacity of 750 gal. per minute to augment fresh-water flow from deep artesian wells. Spray agitators in the flume thoroughly wash the potatoes so that when they are elevated from the flume they are clean and ready for processing, thus eliminating one conventional step—the washer—by combining washing with material handling.

Steam Scalding

From the flume, the spuds tumble onto a 30-ft. inspection belt where defective potatoes are picked out and the balance automatically weighed by a weightometer before traveling into the 6x35-ft. continuous steam cooker. This apparatus is built with the customary hump at its mid-point for more efficient usage of steam. The approximate time of this operation is 14 minutes, and one of its purposes is to heat and inactivate the enzymes in the outer portion of the potato to prevent discoloration or blackening as the processing continues. Another purpose is to soften the skin as an aid to lye peeling.

The scalding equipment itself embodies Mr. Simplot's own ideas and is not open to inspection, being in a steel case from which no steam escapes ex-



Floor plan of Simplot plant. Flowsheet of operations is on page 62.

cept through the vents. Those who are interested in this phase of the process are invited to reread "How the Canner Uses Steam," by Robert Dillman (Food Industries, vol. 4, 179, 214, 244, 1932), in which Mr. Dillman discusses the prevention of air pockets in blanchers by avoiding chimney effects and drafts of air through what is planned to be an atmosphere of live steam. The principal feature of the Simplot scalder is the use of vapor traps, i.e., conveyor legs that trap the steam inside the scalder by taking advantage of the fact that air is heavier than steam. This same principle was described by J. R. Fennema in the article, "Vapor Sealed Bake Oven Solves Air Infiltration Problems" (Food Industries, vol. 6, 408, 1934), where he discussed the use of the conveyor leg to keep hot air in baking ovens. The principle is valid and works wherever intelligently applied.

Lye Peeling

In the next operation, the potatoes pass through a 6x20-ft. continuous lye scalder, directly connected to the steam scalder. The lye scalder is heated by a steam jacket around the outside. A conveyor, powered by a variable-speed motor and fitted with drag slats to hold potatoes under the liquid, pulls the potatoes through a 10 to 15 percent lye solution, 2 ft. deep, in from 1 to 10 minutes, depending upon the quality of the stock.

Conveyors lift the potatoes from the lye scald into two rotary-drum washers fitted inside with slats and mats. Here the spuds are subjected to tumbling under high-pressure water sprays to remove practically all of the skin, then they move directly into two Paramount brush peelers. A cradle of 8-ft. revolving brushes and more water under high pressure remove all traces of lye and skin

Since the preparation of raw material is one of the biggest items of production cost, that department has received much study by the Simplot organization, resulting in a complete change of the peeling method. Formerly, a continuous abrasive peeler was used which caused from 30 to 40 percent loss. Experiments with the lye peeler described here show losses as low as 10 percent and no higher than 20 percent. This means greater production from the same amount of raw material.

Inspection and Trimming

From the peeling process, the product goes directly onto a pair of inspection tables, where obviously defective potatoes are removed, and is thence conveyed to seven trimming and spotting tables via water storage bins. The trimming trables are 3x30 ft., each "manned" by a crew of 30 women. Thoroughness with speed is the watchword here, for the peeled potatoes must be kept moving to avoid excessive oxidation. Above the table proper is a 4-in. belt conveyor, traveling 100 ft. per minute, which carries away the now completely skinned, eveless, blemishless potatoes.

Cutting

On the way to the cutters, the spuds again go over an inspection belt where trained inspectors examine for hollow-

heart and recheck for other defects and blemishes. Then the potatoes go to a battery of five Urschel dicers where they are cut into ¼x¼x1¼ in. strips.

Nearly all potato dehydrating plants cut the spuds into these Julienne strips, even where the final product is a dehydrated mashed potato. And it is done for exactly the same reason that any housewife cuts up large potatoes before boiling them—to make sure that all are about the same size so that they will cook equally.

Some potato shred manufacturers do not cut to uniform size, which is to overlook a principle or characteristic peculiar to this raw material. It first softens on cooking, later firms up, and then softens again. (See FOOD INDUSTRIES, vol. 10, 53, 1938; also FOOD RESEARCH, vol. 2, 377, 1937.) Not many potato operators have read this scientific paper, but many of them are aware of the phenomena. Where large potato chunks are cooked with small ones, the problem of nonuniformity is present even though enough heat has been applied to destroy the enzyme system.

Blanching

The Simplot operation now spreads the diced spuds on a screen-wire conveyor belt traveling through live steam. This blancher, 6x90 ft., is built with the hump, or high point, in the center. It embodies the vapor-trap plan through the simple feature of a 2-ft. hump at the inverted V top of the very obtuse triangular profile. Without such a feature there are bound to be drafts and resultant air spaces which cannot cook the potatoes. At the top of this hump, too, the product is given a "roll over" which aids in producing a more even blanch.

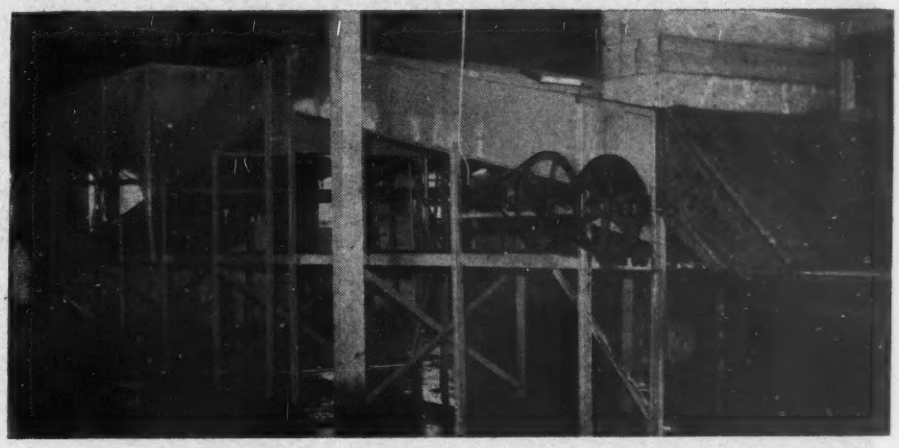
Traying

At the end of the blanching line, the diced potatoes are given a cold-water wash to remove surface starch. Lacking this wash, the strips would mat together and stick to the trays after drying.

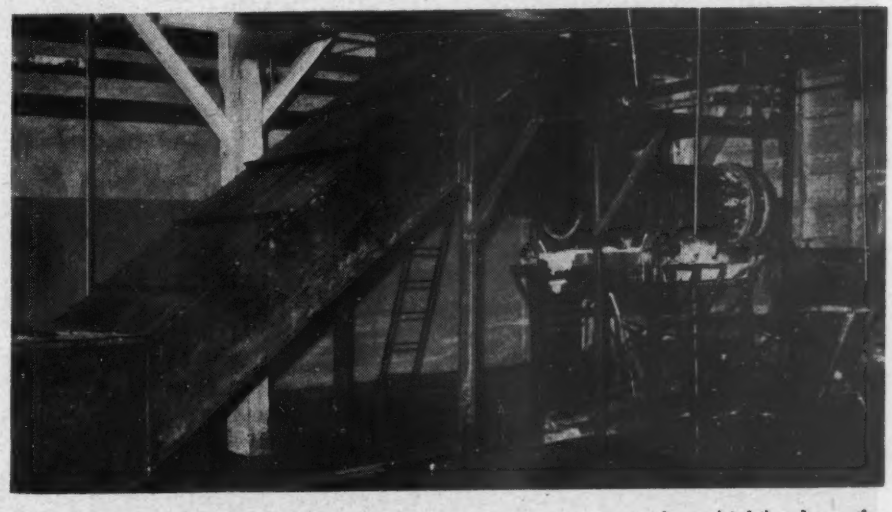
A spreader drops the cooked, sliced potatoes evenly onto a moving line of trays, the tray movement being synchronized with the flow of material to be deposited. Relatively little hand work is needed to secure an even spread. Loaded trays are tiered up, 26 deep, on small cars and pushed into place at entrances to the drying tunnels.

A feature of the Simplot operation is the heavy loading of trays, far heavier than is noticeable at most plants. This helps to achieve large-volume production, but at the cost of lowered drying efficiency. This in turn has been compensated by an increased rate of air flow. From the viewpoint of pure theory, the rate of air movement is surprisingly

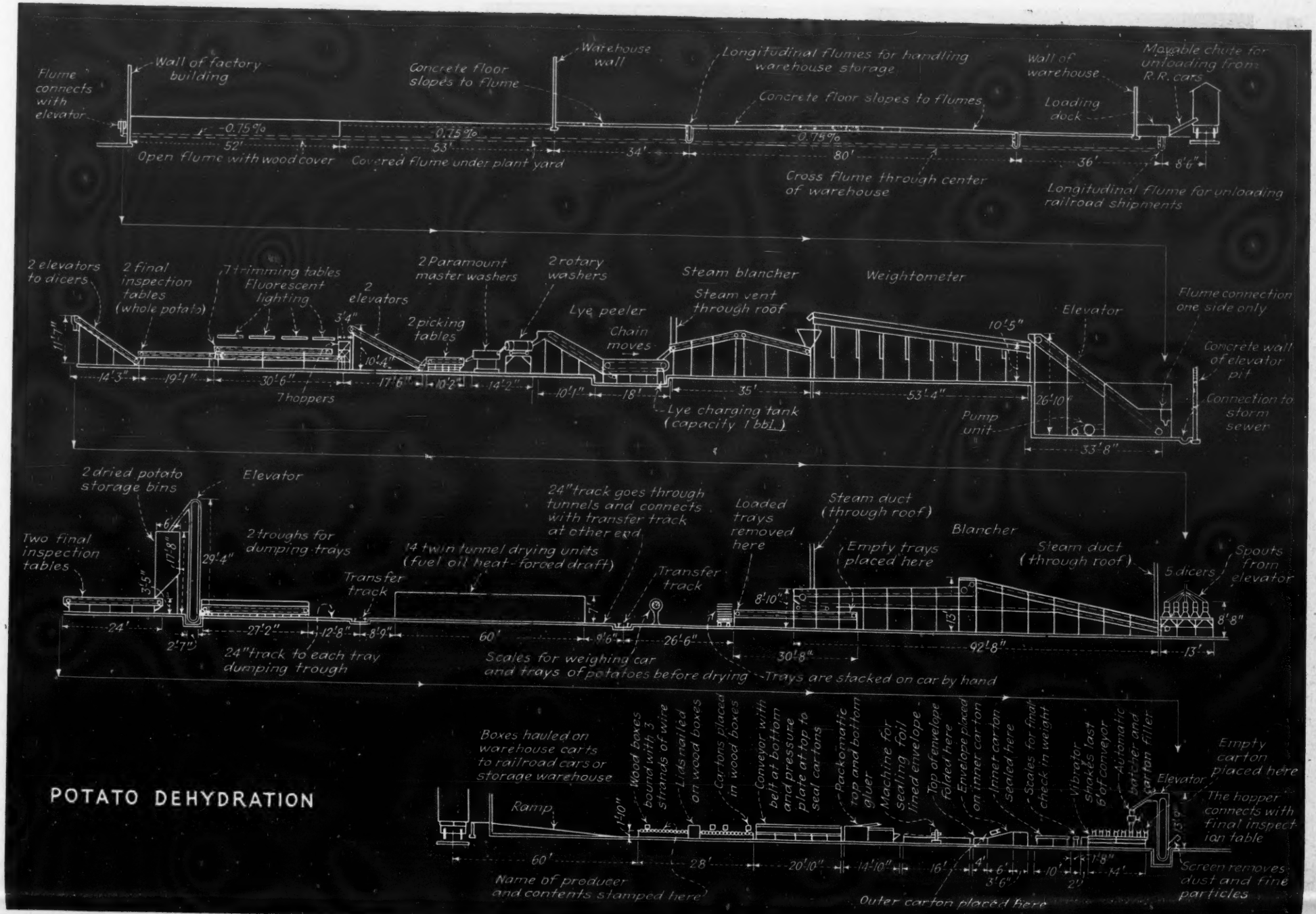
Something new in materials handling. Potatoes are sluiced from floor of thousand-car storage into flume where water floats the spuds into the plant, 100 ft. away. The water washes the potatoes as well as conveying them.



One of two steam blanchers used in the potato dehydrating plant. This one is located ahead of the lye peeler, a departure from standard practice. The other one is between the slicers and tray loader, the customary location.



From the lye peeler, the potatoes are conveyed into rotary washers (right) where the skin and lye are removed by revolving brushes and water under pressure.



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high. It is a veritable young tornado that does not quite blow the product out of the tray.

Dehydration

Before discussing the drying operation, the tunnels—30 of them—should be described. While they embody design ideas of Mr. Simplot, they were engineered by Howard C. Baker of Knipschild Co., Yuba City, Calif. The tunnels are about 40 ft. long and are constructed of hollow cinder-concrete blocks, lined with galvanized iron and heated in pairs by an oil-fired furnace between each pair. Air movement is obtained by 6-ft. propeller fans directly connected to motors that are squarely in front of the hottest air from the furnaces. How these motors can operate in such intense heat without burning out or burning up is a bit of a mystery. They are, however, supplied by a blast of cold air through 6x6-in. ducts, the air discharging into a sort of motor housing that is reminiscent of a splash-proof housing. These motors were special jobs by Fairbanks-Morse Co. and are said to be capable of continuous operation with an external temperature of 400 deg. F.! You will have to take this tale on faith. One does not linger long in front of a hot blast from the furnaces, even in the interest of food technology. One's guess is that the motors are constantly exposed to a temperature of about 200 deg. F.

Only a moderate percentage of air is recirculated in the Simplot driers.

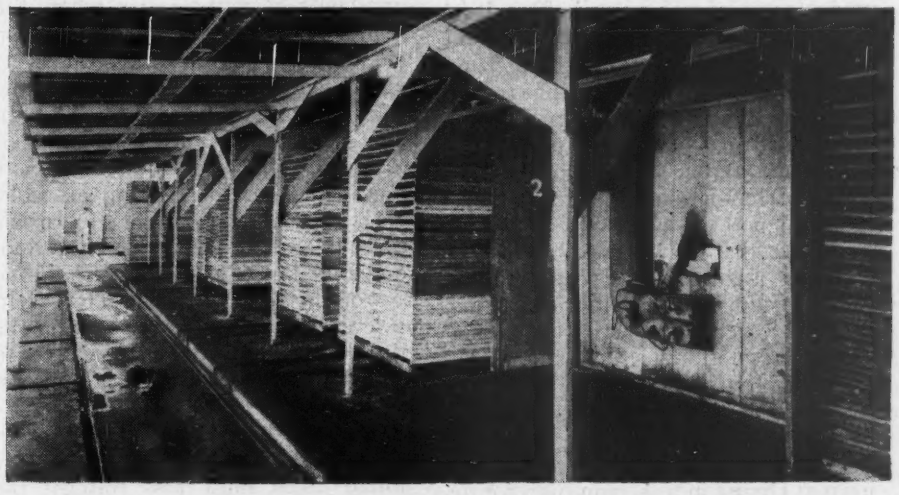
Drying

Drying is done in from 6 to 10 hours, with counter-current air flow, with a temperature of approximately 145 to 150 deg. F. on the dry end. Manual control of temperature is used, based on wet- and dry-bulb thermometer readings. As cars of dry trays are removed, operators start new ones into the tunnels. One aspect of the operations here may have greater importance than is superficially apparent. It is noticeable, particularly after comparing the Simplot operations with those of certain other plants, that the wet material is never allowed to stand around waiting for a place in the dryer. Drying starts immediately after a car is loaded. When there is no room inside the dryer, the fresh car is pushed up against the dryer inlet doors, where enough hot air is permitted to escape to start the drying—which may explain the small amount of recirculation. Apparently fuel is cheaper than overhead.

As each lot comes from the tunnels and before it goes to the dumping hoppers, the dried product is electrically tested with a Steinlite moisture tester.

(*Turn to page 142*)

Two of the seven Simplot trimming tables requiring 210 women per shift. The room is air conditioned and the tables are fluorescent lighted.



View of the hot end of the 30 dehydrating tunnels.

Dumping and scraping the trays on to conveyor belt after the trays are taken from the dehydrater.

Determining Moisture In Dehydrated Vegetables

By F. A. LEE and J. C. MOYER New York State Agricultural Experiment Station, Geneva, N. Y.

Various instruments for quick moisture determinations in the plant have been developed for use by dehydrators. This article compares the results obtained in this way with laboratory results.*

MUCH interest exists in methods for the determination of moisture in dehydrated vegetables in connection with the manufacture of these products as a part of the war effort. It is essential that they be as low in moisture content as it is practicable to prepare them under our present manufacturing conditions. This reduces to a minimum the quantity of water that must be transported and at the same time tends to prevent deterioration during storage.

This report is the result of an investigation that was undertaken to determine the usefulness of several methods for the estimation of moisture in dehydrated vegetables. Speed and reasonable accuracy of the methods were taken into consideration. Rapidity is desirable for control during the dehydration process.

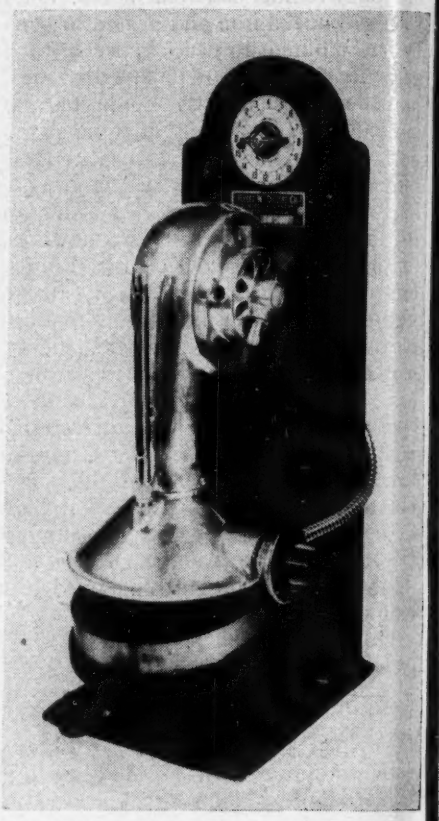
The methods used included the following: Drying in a vacuum oven for six hours at 70 deg. C. was used as the standard of comparison and calibration. This is satisfactory in so far as results are concerned, but is rather slow. The Bidwell-Sterling distillation equipment[1] was also used, because some laboratories wanted to employ this method to avoid the expense of vacuum equipment. In addition, three of the newer devices that have appeared on the market and are intended for the rapid determination of moisture were studied. These instruments represent types based upon different principles of operation. Instruments made by other manufacturers based upon similar principles should be of equal value.

Samples to be dried in the vacuum oven were first ground to 2-mm. size in a Wiley mill. This specification is not according to Army requirements, but in our opinion is necessary in order to obtain concordant results. Two grams of material was used for each sample.

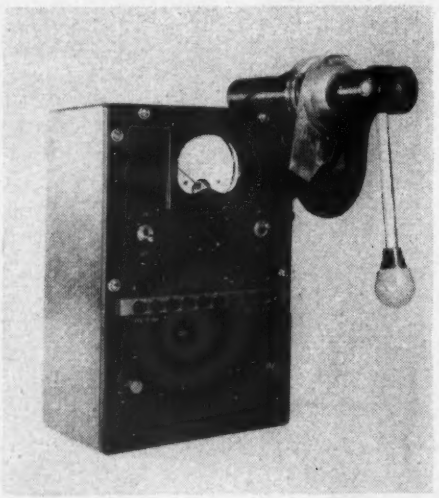
Table I gives figures to illustrate the importance of particle size when the vacuum-oven method is used for the determination of moisture, comparing samples ground to 2-mm. size in the Wiley mill and those ground coarsely in the Griswold combination meat and food chopper, using the knife plate bored with ⅜-in. holes. From this table, it is evident that the size of the particle is very important in the case of the root vegetables, but of less importance in the case of the leafy vegetables. It is felt, however, that it is safer to insist on the grinding of all dehydrated vegetables to the 2-mm. size to ensure a uniform standard.

It should be mentioned that when the grinding is done by hand, all the sample taken must pass through the screen so as to avoid eliminating parts that may be higher in moisture, which in turn would result in inaccurate values. Table II gives figures to show the well-known fact that six hours in the vacuum oven at 70 deg. C. does not remove all the volatile matter. This method, therefore, is strictly empirical. The accompanying curves show the same data that appear in Table II.

The Bidwell-Sterling apparatus was used with toluene[1] for one-half hour, and with benzene for one hour. This method requires that the speed of distillation be regulated to two drops a second. Much difficulty was encountered in securing satisfactory results. It should be remembered that for certain materials, at least, the method is more satisfactory if distillation is continued until a constant value is obtained. Some authors consider this latter value the absolute moisture content. This value,



The Dietert moisture tester operates by a current of hot air blown through the sample, which is weighed before and after drying.



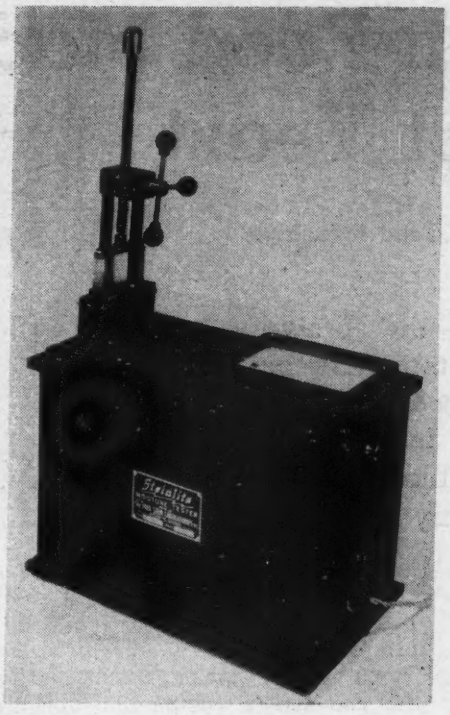
The Hart moisture meter, an electrically operated instrument, determines moisture by variations in electrical conductivity of the dry product.

* Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper No. 438, March 30, 1943.

however, will not check the figure obtained with the vacuum oven[2] at 70 deg. C. for six hours, because, as mentioned before, all the moisture does not come off in the vacuum oven in this period of time. It is well to note that for substances such as corn[2] a period of distillation of about 20 hours is necessary to obtain a constant reading. Our work showed that about the same interval of time is necessary for dehydrated potatoes ground to the 2-mm. size.

Again, size of sample is important. The toluene distillation for the moisture content of dehydrated cabbage cannot be recommended because of the decomposition of this vegetable during the course of this determination. If this method is to be used for any other vegetables, certainly the sample should be ground to the 2-mm. size previous to the distillation.

Three different types of electrically operated instruments now available for the rapid determination of moisture were also studied. These are listed in alphabetical order. To obtain the data shown in the accompanying tables, these instruments were calibrated so as to give results corresponding to those obtained by the use of the vacuum oven at 70 deg. C. and with the samples ground to the 2-mm. particle size. It should be stressed that these instruments can be calibrated to the drying of the sample for any desired length of time in the vacuum oven. Different sets of calibrations are necessary for different periods of drying time in the oven. The six-hour time interval was used in this study because it is commonly used at the present time for the determination of moisture in dehydrated vegetables.



The Steinlite moisture tester determines moisture by variations in the radio-frequency impedance.

The Dietert moisture tester depends upon a current of hot air blown through the sample, which latter is weighed before and after drying. The moisture is calculated from the difference in weight. The pans are weighed hot to save time, and the balance should be sensitive to about 0.01 gram. The actual running time under the blower for cabbage, coarse grind (ground in the food chopper as explained before) was found to be six minutes at 190 deg. F. Undoubtedly other time-temperature relationships would work. The running time under the blower for carrots, coarse grind, was 30 minutes at 200 deg. F. For potatoes, coarse grind, it was eight minutes at 260 deg. F. These determinations checked the vacuum oven for six hours at 70 deg. C. within about 0.25 percent. The calibrations just listed are accurate between 3 and 8 percent of total moisture. This instrument is advantageous for use where extremely rapid results are not necessary and where it is unnecessary to determine a large number of samples at one time. The

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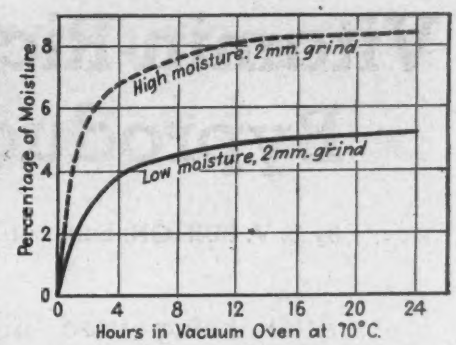


Loss in volatile matter of cabbage samples ground to 2-mm. fineness in a Wiley mill and then dried in a vacuum oven for various periods at 70 deg. C. (158 deg. F.).

TABLE I—Illustrating the Importance of Particle Size.

(Moisture determinations by means of the vacuum oven at 70 deg. C. for six hours.)

Vegetable	Percent moisture, coarse grind	Percent moisture, 2-mm. grind in Wiley mill
Cabbage	7.37	7.38
Potato	4.11	5.19
Potato	7.36	8.97
Carrot	3.09	4.25
Carrot	7.31	9.13

TABLE II—Illustrating Loss in Volatile Matter by Cabbage.

(Samples ground to 2 mm. in the Wiley mill and dried in the vacuum oven at 70 deg. C.)

After 4 hr.	After 6 hr.	After 12 hr.	After 24 hr.
3.89 percent	4.26 percent	4.89 percent	5.30 percent
6.74 percent	6.99 percent	7.94 percent	8.50 percent

TABLE IV—A Comparison of Rapid Methods for Determination of Moisture with Vacuum Oven at 70 deg. C. for Six Hours.

Vegetable and lot No.		Vacuum oven, percent moisture	Dietert,[1]+ percent moisture	Hart,+ percent moisture	Steinlite,+ percent moisture
Cabbage	1	3.02	...	3.0*	2.9
	2	2.68	2.4	3.0*	2.5
	3	4.36	4.1	4.3	4.5
	4	2.02	2.2	3.0*	2.5
Carrot	1	4.55	4.8	4.1	5.1
	2	4.84	5.2	5.0	5.2
	3	4.34	4.1	4.0	4.6
	4	3.74	3.7	3.4	4.0
	5	5.00	5.0	4.7	5.4
	6	3.58	...	3.4	3.8
Potato	1	4.89	...	5.7	4.9
	2	4.15	4.5	5.2	4.4
	3	5.37	5.5	6.0	5.6

* Less than.

[1] Cabbage, 190 deg. F. for 6 minutes; carrot, 200 deg. F. for 30 minutes; potato 260 deg. F. for 8 minutes.

+ Coarse-ground material was used for these three instruments. The samples run in the vacuum oven were ground to the 2 mm. size.

TABLE III—Moisture Contents of Dehydrated Vegetable Samples of Varying Total Solids.

(As measured by means of the vacuum oven, distillation methods, and the Dietert equipment. These samples were used to calibrate the electrical instruments.)

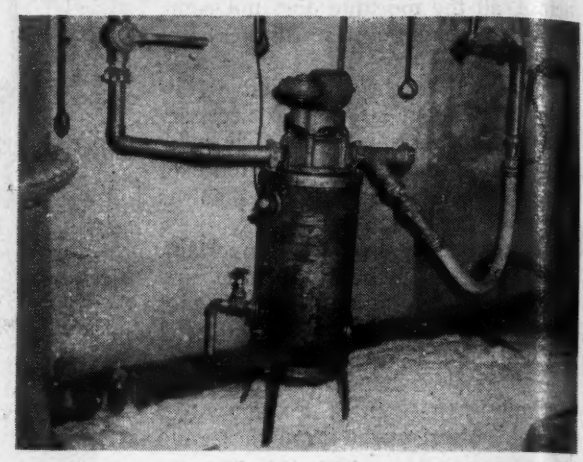
Vegetable and lot No.		Vacuum oven 6 hr., 70 deg. C., 2-mm. grind, percent moisture	Bidwell-Sterling, benzene 1 hr., 2-mm. grind, percent moisture	Bidwell-Sterling toluene half hour, 2 mm. grind, percent moisture	Dietert,[1] coarse grind, percent moisture
Cabbage	1	1.07	1.00	1.90	...
	2	2.90	2.90	4.6	2.9
	3	4.26	4.4	5.1	4.4
	4	4.40	4.3	7.4	4.5
	5	5.41	5.3	7.9	5.4
	6	6.61	6.6	9.2	6.5
	7	7.38	7.3	10.2	7.3
	8	8.96	8.7	11.0	...
Carrot	1	3.09	3.2	4.8	3.0
	2	3.41	3.6	4.8	3.6
	3	4.25	4.6	6.2	4.4
	4	4.53	5.0	5.5	4.5
	5	6.81	7.2	8.6	6.5
	6	7.01	7.2	7.4	7.1
	7	7.23	7.8	8.8	7.2
	8	9.13	9.2	11.6	8.7
Potato	1	2.19	1.5	2.8	...
	2	3.46	3.0		3.3
	3	5.19	4.4	5.8	5.1
	4	6.21	5.5		6.3
	5	7.01	6.0	6.4	7.1
	6	8.19	8.0		8.3
	7	8.97	8.8		8.5
	8	10.17	9.6	10.9	9.7

[1] Cabbage, 190 deg. F. for 6 minutes; carrot, 200 deg. F. for 30 minutes; potato, 260 deg. F. for 8 minutes.

Vitamin-Rich Food Made From Byproduct Yeast

By L. V. BURTON, Editor of "Food Industries."

After being used in the brewery, yeast is treated by simple chemical and bacteriological process to debitter it and make it rich in vitamin B. Priorities were no problem in equipping the plant, as many of the units were home made



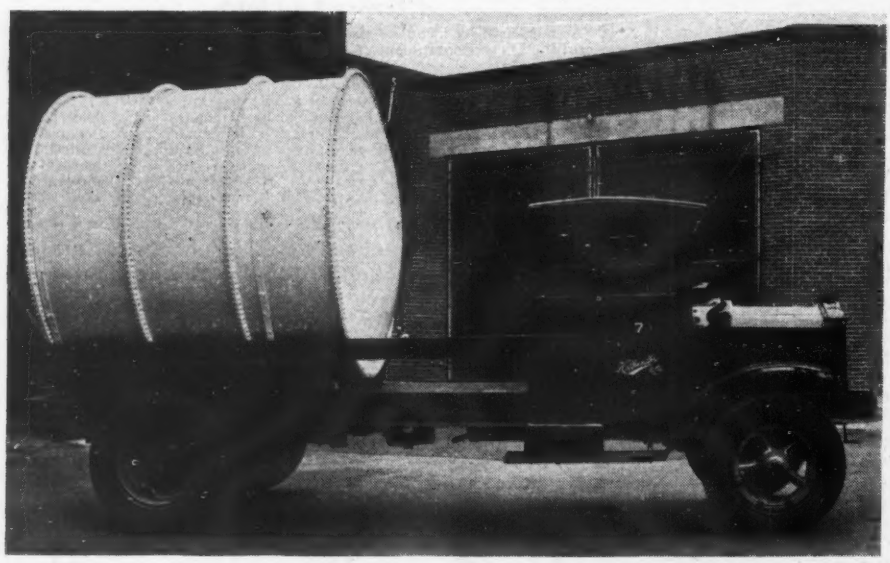
A Cuno filter is used to remove fibrous material from the yeast as it is received from the fermentation cellars.

IN view of the current demand for a vitamin food supplement, the efforts of brewers to save a byproduct that previously has been neglected is a notable contribution to the national nutrition and food program. The byproduct is brewer's yeast, *Saccharomyces cerevisiae*, which increases at least six-fold in the fermentation of a tank of beer. This means that for each pound of the inoculum or, as the brewer calls it, the "pitching yeast," there is recovered about 6 lb. of the same yeast, because the yeast multiplies heavily in the process of the fermentation of the wort to beer.

During the period of growth, the yeast gathers up about all the vitamins that were present in the ingredients and probably manufactures further quantities of vitamins of the B complex. It also collects much of the nitrogen, present in the wort as protein, and in the end has a composition roughly comparable to that of meats when reduced to the same moisture content. But it also absorbs a goodly portion of the hop resins and flavors, thereby becoming quite bitter to the taste. To convert the residual yeast to a palatable human or animal food, the yeast must be freed from the bitter hop flavor, *i.e.*, debittered, washed, concentrated and dried.

The tremendous demand for debittered brewer's yeast for both its protein and vitamin content has led Haffenreffer & Co., of Boston, to develop a method of producing dried debittered yeast of three types: (1) Natural debittered yeast which has a moderate normal vitamin content; (2) enriched debittered yeast which has been enriched by synthetic vitamins; and (3) naturally fortified yeast which has been enriched by taking the natural vitamins from one lot of yeast and absorbing them in another lot of the yeast.

T. C. Haffenreffer, Jr., has been in charge of the yeast recovery development program of the company, and with the aid of the research department, he has succeeded in building a commercially operating plant without the aid of many priorities or new equipment. Some of the equipment was spare parts, spare tanks, pumps and the like, or things that could be purchased second hand. Even electrical junk shops contributed an old sign flasher that was converted to an automatic motor reverser.



Improvised tank truck for gathering liquid yeast from other plants. When in use, this truck must carry a label clearly indicating that it contains brewer's yeast.

Biological Principles Involved

The enrichment of the yeast by synthetics or by natural fortification depends on the fact that the yeast is still alive and able to grow after it has been washed with alkali to remove the bitter hop flavor. As is well known, growing yeast will absorb vitamins from the liquid in which it is growing. Hence, if any vitamins are added to the debittered wet yeast, the growing organism will take them up and can then be dried with the vitamins now inside the cells. Two sources are open for the enriching vitamins: synthetics and the vitamins that can be removed from other yeast by plasmolysis—a gentle cooking at 148 deg. F. The latter method has been developed by research at Haffenreffer & Co., but is not patented.

To accomplish the desired end in an industrial way at low cost requires close control of pH and temperatures as well

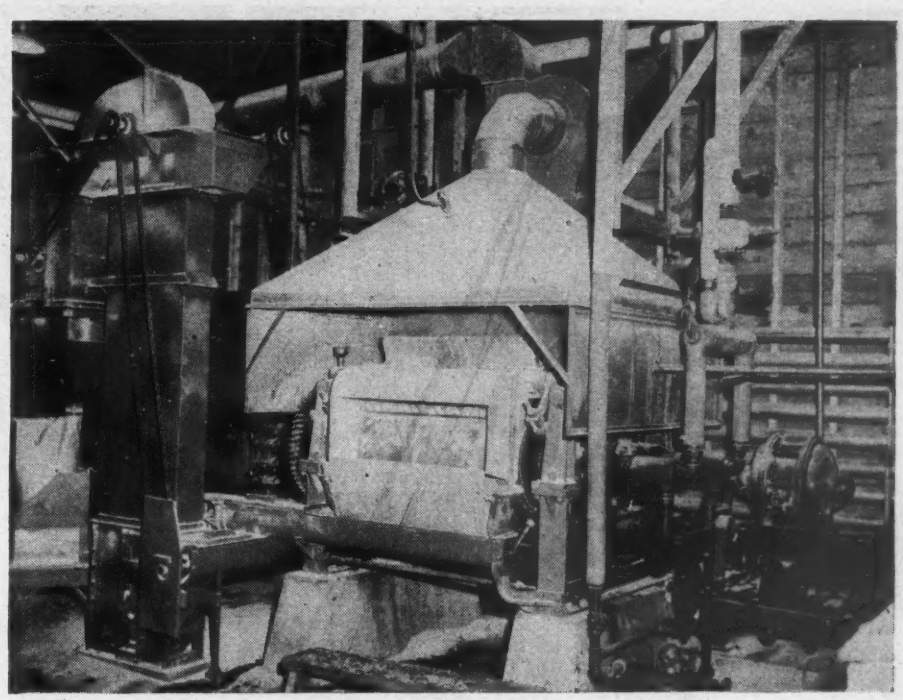
as time. The fact that it has been brought to a successful commercial process without the purchase of much new equipment is a tribute to Haffenreffer resourcefulness.

The Commercial Process

From the foregoing statement of principles involved, the rest of the discussion is straight process engineering and quality control. By reference to the flow diagram, Fig. 1, the process can be followed. Yeast comes from the fermentation cellars via a pipe line, carrying with it a considerable amount of fibrous material from the hops which, if not removed, would clog the nozzles of the spray dryer and separator. After trying all manner of methods to remove the fiber from the creamy suspension of yeast, the Cuno filter was found to be successful. But the peculiar residual material clogged even this filter until it was discovered that reversing the drive motor every two revolutions of the filter would free it of the objectionable fiber.

Home-made Automatic Reverser

Here is where the old sign flasher comes in. By changing the speed of the flasher by some old sprockets and chain, the flasher became an automatic reversing switch. The cleaning mechanism of the filter is driven by a small three-phase induction motor making reversal of direction a very simple matter. But even this two-revolution-and-reverse method was improved by back-washing the filter every 15 minutes, and this procedure is so satisfactory that it cannot be duplicated by any other known method. Once the yeast suspension has been filtered free from fiber, no further filtering is needed.



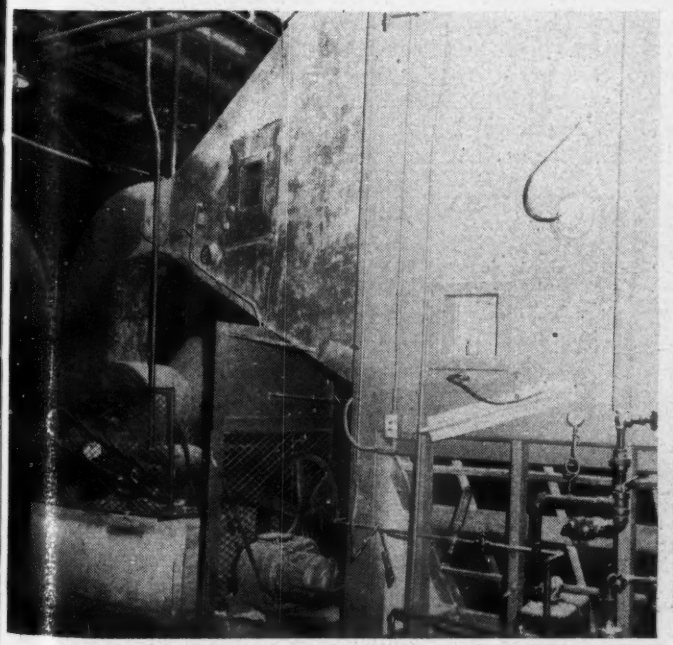
Roll dryer used for part of the product. Packaging equipment is at the left.

Debittering

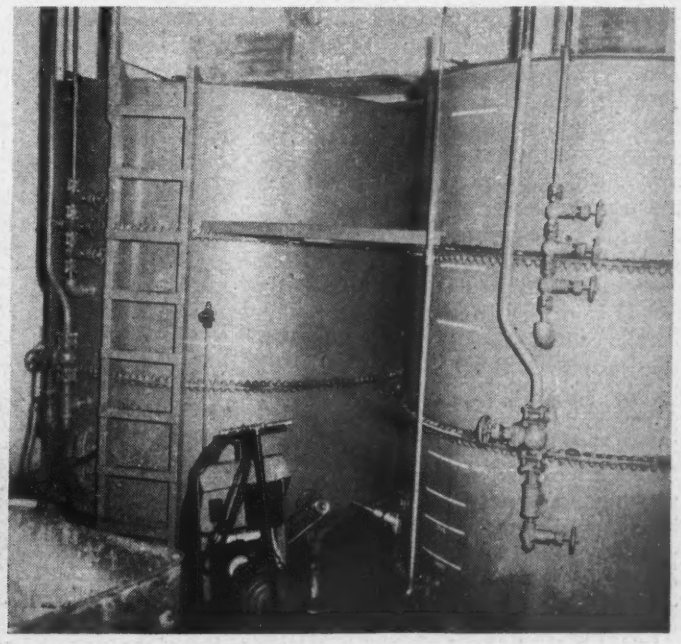
Alkali treatment is the basis of removing hop resins from yeast. The resins are on the outside of the cells and in between the clusters of cells. At pH 11 to pH 12, the resins are dissolved in the form of their sodium salts and can be washed away.

Into a large glass-lined tank is placed 10,000 lb. of water which is brought to pH 11 to 12 by the use of purified caustic soda. To this is added 5,000 lb. of strained liquid yeast (suspension). It is then agitated violently by a motor-driven propeller mixer (also home constructed) for from five to ten minutes.

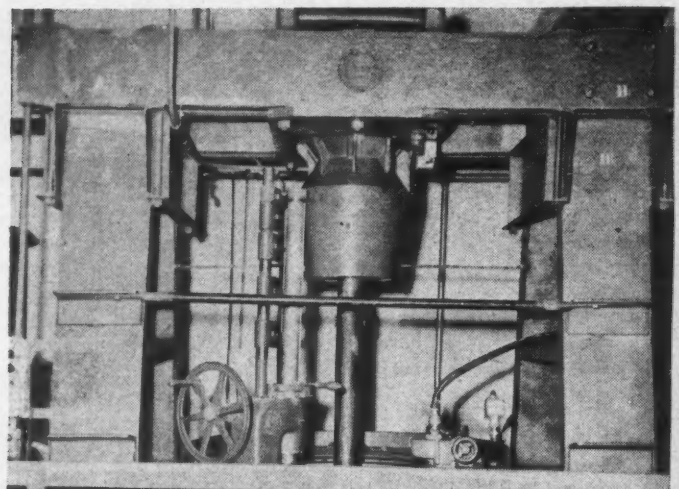
All purifying operations are carried out in a refrigerated cellar at 47 deg. F. Strangely enough, though alkali is usually very toxic to all living things, the yeast remains alive if promptly put through the next operations to wash



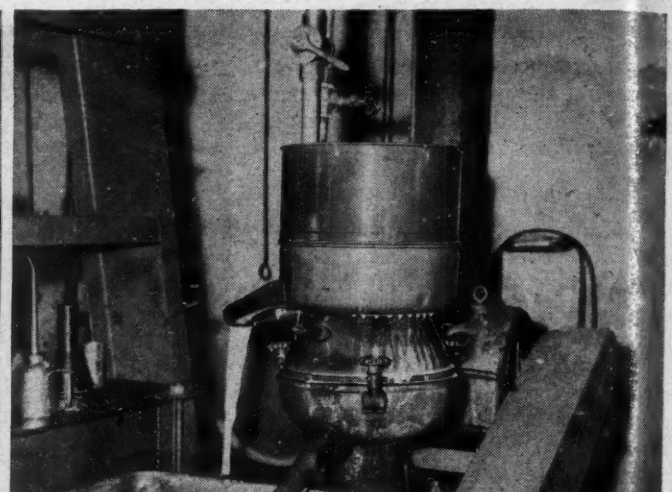
Entrance end of the spray dryer, showing the blower. The spray nozzles are located at the narrow end of the funnel.



Debittering and washing tanks in which the fresh yeast is treated successively at decreasing alkalinities.



Imperforate basket centrifuge used to remove the yeast sacs from the thick suspension which remains in the plasmolysing tank after decanting.



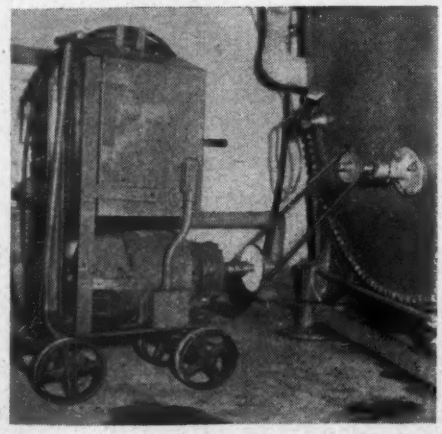
Alpha Laval yeast separator. The heavy yeast suspension is saved, while the wash liquid, now very foamy, is allowed to run into the sewer.

away the alkali and dissolved hop resins.

Passage through an Alpha Laval yeast separator (Alpha is the European design —also bought second hand), separates the yeast from the bulk of the alkaline water. The yeast concentrate, in the form of a cream from the lower spout of the separator, is pumped into another tank containing 10,000 lb. of water, which this time is adjusted to pH 9. After it is all transferred into the tank, the agitation is continued for 10 minutes. Then the entire contents are passed through the separator again. In this, as in the previous case, the spent alkaline wash water is discharged to the sewer, which incidentally makes a tremendous sudsy foam that is due for a scientific investigation to see what is there that may be useful.

A final washing in 10,000 lb. of water at pH 7 for ten minutes with agitation is followed by still another trip through the separator. By this time the 5,000 lb. of liquid yeast is free from hop flavor and is pumped by a gear pump to a glass-lined scale tank of about 6,000-lb. capacity, equipped with a motor-driven propeller agitator (also home made) for treatment with phosphoric acid (H_3PO_4) to bring the pH of the yeast cell walls down to the normal pH of the cell fluid, pH 5.4. Thiamine is more stable at a lower pH and also when combined with H_3PO_4 to form a complex phosphate.

The product is now debittered natural yeast, ready for immediate drying, enrichment or natural fortification. If the yeast is to be enriched, the synthetic vitamins are added here in proper amounts calculated to produce the vitamin content desired. This accounts for the scale tank—from the weight of the liquid yeast and its density can be calculated the amount of compressed yeast or wet yeast solids in the tank. Synthetic vitamins, if added here to standardize the vitamin content at a predetermined level, are absorbed by the still living yeast if suitable soluble carbohydrate is added. The latter is needed for sustaining the growth of the yeast, for without growth there is little vitamin absorption.



End of the plasmolysing tank, showing heating or cooling coils and the portable stirrer motor.

If the final product desired is natural debittered yeast, or enriched debittered yeast (after enrichment in the scale tank), the liquid yeast is pumped by gear pump to a 10,000-lb. dryer feed-tank, also in the cellar, from which it is fed either to the roll dryer or to the spray dryer to be described later. But if it is to be Haffenreffer's naturally fortified yeast, then a batch must be plasmolysed to get the vitamins out of the cell sacs so that the vitamins may be reabsorbed into natural debittered yeast from another lot in a special absorbing tank.

Plasmolysing Equipment

To plasmolyse the yeast, a 17½-ft. horizontal glass-lined tank, holding 200 bbl. or 6200 gal., is used. This is equipped internally with a decanting device, as shown in the flow diagram. Also, the tank is equipped with internal steam heating coils controlled by a Powers regulator. And there is a motor driven 16-in. propeller agitator on one end to keep the liquid in constant circulation during the plasmolysing, as well as the heating and cooling, period.

Another feature of the accessory equipment is a tubular heat exchanger with a water section and an ammonia section to cool the liquid yeast by re-

pumping around and around when plasmolysis is complete. The plasmolysing department is located in a separate refrigerated cellar.

To plasmolyse the yeast means to rupture the cell walls and get the yeast fluid into solution or suspension. It has been found that 30 minutes at 148 deg. F. will do the job. But the liquid must be promptly cooled afterward to 47 deg. F. by circulating it through the internal tubular cooler previously described. Prior to plasmolysis, all pumping of the viscous liquid yeast must be done by gear pumps. After plasmolysis, the liquid loses its viscosity to the point that it can be pumped by a centrifugal pump. This fact alone is testimony to the change that has taken place during the 30-minute gentle heating period.

Now comes the job of separating the empty yeast sacs of microscopic size from the liquid. In the brewery these are called "yeast bags." The separation is done by decanting by means of the floating dip pipe. The tank and its contents are allowed to stand quietly for 16 hours at 47 deg. F. and then decanted. The supernatant liquid is the desired part; the yeast bags are of no known value.

Decanting continues until the liquid in the tank is down to a depth of 17 in. This residual liquid is now run through a vertical imperforate, or solid-basket, type of centrifugal made by American Tool and Machine Co. (This item of equipment was *not* home made). Yeast bags are retained in the basket, while the liquid escapes and is collected with the other supernatant liquid in the absorbing tank.

All this liquid is a dilute aqueous solution or suspension of the contents of 5,000 lb. of liquid yeast. To separate the vitamin content of this large amount of liquid would be very costly by chemical or physical means, but by biological methods, it is very simple and inexpensive. The plasmolysed solution is added to live debittered yeast with a little cerelose, and in 24 hours the vitamin B_1 is all inside the yeast cells.

The absorbing tank is a horizontal 5-section glass-lined tank equipped with another home-made propeller agitator and a pair of internal, direct-expansion ammonia coils to control temperature. This equipment is not inside the refrigerated cellar, although it is indoors where room temperature prevails.

To absorb the vitamins from the liquid, cerelose is added with constant agitation. Then comes a batch of debittered yeast from the scale tank. The amount of debittered living yeast is about one-sixth the weight of the yeast which has been plasmolysed. Nearly all the vitamin B_1 that was present in seven parts of yeast is concentrated in one part, giving almost a seven-fold concentration in the yeast cells.

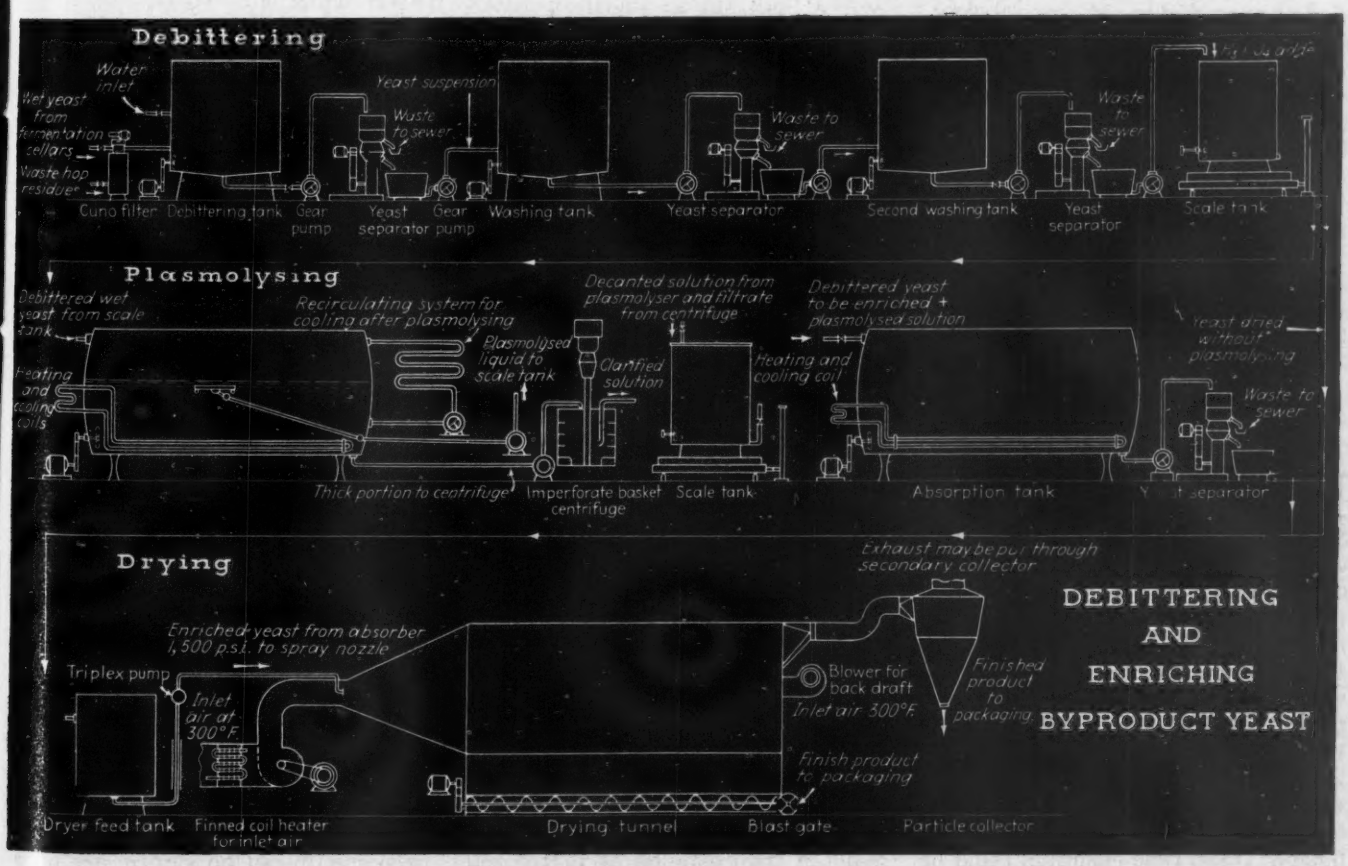
The liquid yeast is now passed to the yeast separator by a centrifugal pump, and the yeast concentrate so produced is pumped by a gear pump to the dryer feed tank.

Drying

Two methods of drying are utilized. Part of the yeast is dried on a double-drum dryer that needs no description here. The other part is dried in Haffenreffer's home-made spray dryer. This machine embodies so many ideas that it is difficult to give proper credit to all the sources, but Atlantic Research Associates must be mentioned.

The Haffenreffer dryer is a 20-ft. horizontal spray tunnel. It is equipped with a collecting-hopper bottom having a helical spiral conveyor which carries the dried product to a recovering blast gate, through which it is removed. On the inlet end is an 8-ft. funnel added to give a little longer drying travel for the particles. A 4,000-cu.ft.-per-minute Sturtevant blower draws air through finned coil heaters and blows it into the drying chamber at 300 deg. F (This is dry bulb temperature, the wet bulb temperatures

(*Turn to page 144*)



Flow diagram of byproduct yeast processing, showing the three stages of debittering, plasmolysing and drying.

Courtesy Fishing Gazette

Seining mullet on ocean beach near Beaufort, N. C. The yearly catch of mullet ranges from 30 to 40 million pounds. Most of this is marketed fresh, but there is a great potential market for brine-salted mullet.

Brine-Salted Mullet Has Unrealized Possibilities

By CHARLES F. LEE and LEO YOUNG, Technologists,
Division of Fishery Industries, Fish and Wildlife Service, Department of the Interior.

An increase in the catch of mullet and more widespread use of brine salting are urged to promote more general utilization of this food resource of our coastal waters. The author tells how brine salting is done and interprets its advantages

MULLET has been for many years, and still is, the leader of all Southern fish in quantity taken. The catch of mullet is four to five times that of such species as the red snapper, sea trout, croaker and spanish mackerel and is surpassed in poundage by shrimp alone. Yearly catch figures vary somewhat but range from 30 to 40 million pounds. About three-fourths of the total catch for the South Atlantic and Gulf coasts is taken in Florida, although the fish is common from North Carolina to the Mexican border. In certain areas, notably Texas, large quantities could be taken if the market were favorable.

At present, the bulk of the catch is sold fresh. The annual statistics for 1940 show a pack of salt mullet amounting to less than 2,000,000 lb., representing about one-fifteenth of the total catch. This indicates a decline of 300,000 lb. over the previous year and is 1,000,000 lb. less than the 1937 pack.

The concentration of the mullet fishery within a small area and the seasonal nature of the fishery are adverse factors that result in glutted markets, wasted fish and restricted fishing efforts. Prompt preservation of the fish as landed should result in the expansion of the present fisheries, and in some areas lead to the development of a new fishery at a time when the war has made it necessary for every food resource of this country to be utilized to the fullest.

The methods which have been used for the preservation of fishery products are canning, freezing, salting and pickling, smoking and, recently, dehydration. The mullet is a low-priced fish, and in the past only the simplest methods, such as salting and smoking, have been used for its preservation. Because of the scarcity of many kinds of fish since the start of the war, mullet has been canned and dehydrated on an experimental scale. These processes may soon come into commercial production.

Advantages of Salting

The salting of mullet is, however, a very important method of preservation because it is a process involving negligible expense for equipment and materials, and it can be carried out on a small scale by individual fishing units at

the place and time of landing. This means that the fish may be processed while in prime condition within a few hours of the time they are caught—one of the first requisites to the preparation of a first-quality product. The hot weather prevailing for eight or nine months of the year in the states where mullet are caught, together with the uncertainty of the overburdened transportation systems, only serves to emphasize the importance of handling the fish as close as possible to the landing port.

Historically, mullet has been both brine and dry salted. The dry-salted mullet was reported to have been of good quality, keeping in good condition for three or four months. It was admitted that those packed in July and August were more subject to "rust," as were those packs in which salting had been delayed more than three or four hours after catching the fish.

Salted mullet has been prepared in North Carolina and Florida, and to some extent in Alabama, for many years, but its popularity has gradually declined. At present, however, Puerto Rico and other islands of the Caribbean area, as well as certain South American countries, have been deprived of one of their staple foods with the disappearance of salt cod from export shipments. These countries have been heavy consumers of hard salted cod and represent a large ready-made market for salted mullet. Trial shipments have already been made to Puerto Rico and were favorably received. Salted mullet should also find more general acceptance in the markets of this country when care is taken to produce a high-quality product from prime fish. Most of the present pack is sold in the South and South Central states. In the studies conducted at the College Park Laboratory of the Fish and Wildlife Service, it was not possible to obtain mullet of first quality, and possibly for this reason, a dry-salted product could not be prepared which did not "rust" rapidly and become unpalatable.

Brine-salted Mullet

In the preparation of brine-salted mullet, the fish should be dressed as soon as possible after removal from the nets or seines, within six hours at most. The fish are split down the back, along the backbone, cutting through the heads so that the fish can be laid out flat. The viscera are now readily pulled out. The roe, in season, are usually separated and dried, salted or smoked, as a profitable byproduct. The gills are removed, but the black membrane lining the belly is usually left intact. The appearance of the product is improved if the black membrane is removed, but it may not be practicable to do this if the number of the fish to be handled is large or the packing plant is short handed. The heads and foreparts of the backbone are often removed from the larger fish, those weighing more than 1½ lb.

Small mullet, those weighing under ¾ lb., may be salted in the round or with the removal of the viscera through a slit in the belly. When the fish are packed round, the air bladder (or sound) must be punctured by inserting a thin knife through the gill opening. After removal of the viscera, the fish are washed in seawater or light brine to remove blood and slime. Soaking for half an hour in brine will help remove the blood and make the cleaning operation simpler. If a large number of fish must be handled and the temperature is high, this will not be possible. In fact, the initial cleaning operation may be eliminated in favor of getting the fish into the salt as soon as possible. Under these circumstances the fish are repacked within two or three days and thoroughly cleaned at this time when in a less perishable condition.

The fish are now ready for salting. The type of salt used is an important factor in the production of a good pack. In general, mined salt is preferable to sea salt as it is cleaner and contains less chemical impurities. The ocean salts are also carriers of the bacteria that cause reddening of the fish. A finely ground grade of salt is sometimes used when a very quick pickle is necessary. But the coarse-ground salt crystals are in general use and are always used in repacking.

In packing, a heavy layer of salt is placed on the bottom of the barrel or keg and a layer of fish is placed on it, open side up. This layer is then liberally sprinkled with salt and the second layer of fish is added. Repeat the operation until the barrel is full. The fish are usually packed fanwise, heads out, tails toward the center, and care is taken that they do not overlap. Every surface should be exposed to the action of the salt. The top layer of fish is placed cut side down and a heavy cover of salt placed over all. It is usually necessary to place several boards on the top of the pack and weigh them down so as to keep the fish submerged in the pickle that forms.

Sufficient pickle to cover the fish should form within 18 to 24 hours. If not, a concentrated brine (95 percent salinometer) should be added until all fish are under the pickle. Under these conditions the fish should be "struck through" by the salt within four to ten days, depending upon the size of the fish. The average size mullet, 1 to 1½ lb., should be "struck through" within five days to a week. If possible, the fish should be held during the "striking through" period in a cool room at a temperature not exceeding 50 deg. F., particularly in the case of small mullet packed round where the penetration of the salt and the formation of the pickle is much slower. With these fish the strong brine to cover is often added immediately after packing.

Mullet are repacked after being "struck" or, as mentioned before, after two or three days if the fish have not been cleaned. They are graded and sorted for size and condition, and any blood, salt, scales and slime are rinsed off in brine. The clean fish are now packed—with a layer of salt on the bottom and on the top and a slight sprinkling of salt between each layer—into the smaller buckets, kegs or barrels in which they are to be sold.

The containers are then headed up, and concentrated (95 to 98 percent salinometer) brine is added slowly through the bunghole. Care is taken to allow the brine to seep down into all the crevices between the fish and expel all the entrapped air. When no more brine can be added, the hole is plugged and the containers are placed in cool storage.

The kegs or buckets should be opened for inspection at intervals during storage and concentrated brine added to replace losses due to leakage and evaporation. This constant care to maintain the mullet at all times under a protective cover of brine is made necessary by the high fat content of the mullet flesh. The amount of fat in the mullet will vary from 3 to 8 percent with the season and size of the fish. In fresh or properly cured mullet, this fat is desirable because it gives this species its characteristic flavor. This fat will become rancid readily if exposed to the air for even short periods of time during salting and storage, resulting in a product of greatly reduced quality and value.

In ordinary storage at room temperature, the mullet is at its best from one to six weeks after packing and probably should not be kept for more than two months. If it is convenient to hold the fish at temperatures under 50 deg. F., the storage life may be prolonged by several months, provided proper care is taken in maintaining the proper level of the pickle in the tubs. The higher temperatures promote the growth of several salt-tolerant organisms. One of these is responsible for the reddening of the fish flesh, and eventually, putrefaction of the fish. This organism will grow in saturated brine at an optimum temperature of 70 deg. F. Proper sanitation in the packing house and the use

(*Turn to page 144*)

A Well-Engineered Trucking Operation

Southern food distributor selects trucking equipment which carries a 45,000-lb. payload, yet meets the restrictions of three states and the requirements of a long route

ONE of the outstanding grocery-hauling operations of the deep South, the tractor-trailer run of Salley Grocer Co. of Bernice, La., is unusual because of the 300-mile length of haul and the maximum payload of 45,000 lb. carried.

Bernice is located 85 miles east of Shreveport, La., and just below the Arkansas-Louisiana state line. The Salley company operates large grocery warehouses located at both Bernice and Shreveport.

The 45,000-lb.-load-carrying tractor-trailer is used to move loads of miscellaneous groceries between the company's two warehouses and to haul to these warehouses inbound loads of large lots of various food products purchased in Memphis and New Orleans. It is approximately 285 miles from Bernice to Memphis and 300 miles by road to New Orleans. The relative position of these two large distributing centers to Shreveport and Bernice and the routes covered between them are shown by the accompanying map.

In addition to bringing in full loads from Memphis and New Orleans and transferring goods between the Shreveport and Bernice warehouses, the tractor-trailer is used to haul loads of miscellaneous groceries from the Bernice warehouse to stores.

An Engineering Job

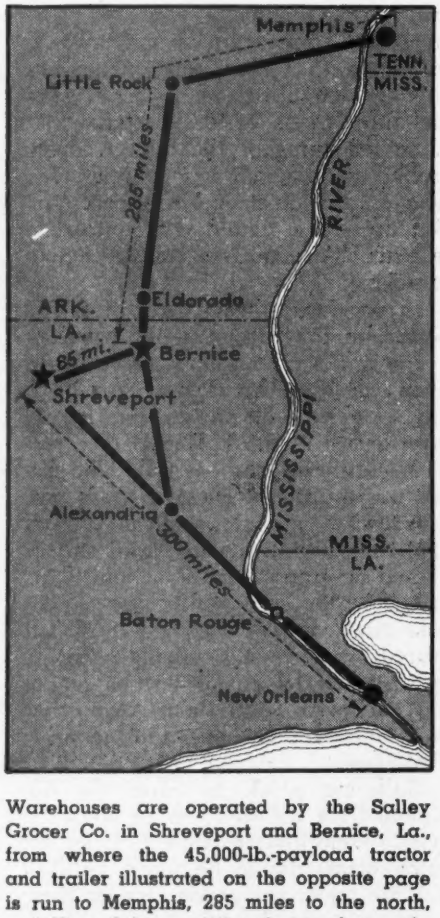
Some interesting automotive engineering work preceded the make-up of the Salley motorized train and its inauguration into actual service. Because of the none-too-good railroad service between the various points in the Salley sales and source-of-supply areas, it was decided to move the large incoming loads by road, along with the warehouse transfers. The warehouse-to-stores deliveries had to be made by motorized equipment because in many instances there was no other method of making such deliveries.

Next, because of the narrow margin of profit between cost and selling price on most grocery items except coffees and teas and a relatively few luxury numbers, the loads carried had to be as large as possible. Yet the equipment had to be kept within the legal Louisiana, Arkansas and Tennessee state limits of weight and length. These restrictions, of course, made it necessary to utilize the tractor and trailer type of equipment rather than conventional motor trucks.

Advantages of Tactor-trailer

By going to the tractor-trailer, the Salley company was able to utilize the fundamental advantages of this type of equipment. These include the ability to pull more than a truck of equal tractive effort can carry and to distribute the large loads over a greater length with more axles.

The distribution of the larger load over a greater length and more axles gives a unit axle loading no greater on the tractor-trailer combination than on the conventional two-axle truck. This serves to protect the roadways against excessive overloads, and the greater length of spacing between the tractor and trailer axles likewise prevents overloading of the highway bridge spans. These are important factors on the Louisiana, Arkansas and Tennessee roads over which the Salley equipment operates.



Warehouses are operated by the Salley Grocer Co. in Shreveport and Bernice, La., from where the 45,000-lb.-payload tractor and trailer illustrated on the opposite page is run to Memphis, 285 miles to the north, and New Orleans, 300 miles to the south. The map shows the location of the warehouse cities, their position in relation to other cities and the routes covered by the tractor-trailer combination.

Overall Length Limited

With the tractor-trailer type of equipment decided upon, the next limitation in the design of the unit was the overall length of 45 ft. from the front tractor bumper to the trailer tailgate. Here it was evident that the cab-over-engine type of tractor was the most desirable due to its shorter wheelbase as compared with the engine-out-in-front design. The former permits a longer length of trailer in order to secure the maximum trailer load-carrying floor area. Trailer width is limited in all states to 96 in., and trailer height is governed by existing bridges. So the longest possible trailer length will permit the heaviest payload to be carried.

Sleeper Cab Required

Since the tractor-trailer was to run to New Orleans, a road distance of approximately 300 miles and a round trip of 600 miles, it was necessary to provide two drivers for the round trip. This in turn called for the use of a sleeper cab, with a bunk to the rear, crosswise but inside of the cab, to provide adequate comfort for the drivers.

With the short-coupled, cab-over-engine tractor with its sleeper cab decided upon, it was determined by calculation that 30 ft. was the maximum length of trailer which could be used and still keep the overall length of the combination within the legal state limits of 45 ft. The unladen weight of such a unit was calculated as 21,000 lb.

Determining the Payload

The next problem to be solved was to determine the largest possible payload which could be carried on the unit without exceeding the axle loadings and gross vehicle weight as set by the state laws. Tandem axles under both the tractor and the semi-trailer—or five axles in all instead of the three axles usually employed on semi-trailer combinations

International cab-over-engine model DS 500T tractor and Fruehauf 30-ft. trailer used by the Salley Grocer Co., Bernice, La., to haul 45,000-lb. loads of groceries in the deep South. It also hauls to Bernice loads purchased in Memphis, Tenn., 285 miles to the north and from New Orleans, 300 miles to the south. The routes covered are shown on the map on the opposite page.

—was the answer to provide a maximum payload of 45,000 lb. and a gross vehicle weight of 66,000 lb.

Selecting Tire Size

Next, tires of the proper size had to be selected to carry the loads distributed over the fixe axles, with dual tires on each end of the four rear axles, leaving single tires only on the front tractor axle because of its steering function. The unit thus has 18 rolling tires in contact with the road.

With the number of tires thus set at 18, the size of tire could be determined so as to carry the distributed gross weight on each axle and still not have any individual tire loaded beyond its safe carrying capacity. While the tires on the front tractor axle could have been of a smaller size than those required on the other four axles because of the physical inability to load the front end of the tractor as heavily as the rear, two sizes of rolling tires would have required carrying two sizes of spares. To avoid this, all tires on the unit were made of the same size, namely 9.00-20. The two spares of the same size carried beneath the trailer body thus serve as replacements for any of the 18 rolling tires.

With the automotive engineering of the job thus completed, there remained only the selection of the tractor and the semi-trailer by makes. The tractor chosen was an International Model DS 500T and the trailer a van-type 30-ft. Fruehauf with a rounded front end.

The unit was put into service in November, 1940, and has been in continuous use since that time, having covered over 300,000 miles to date. It has not been in an accident of any kind and its owners state that it has given uniformly satisfactory service.

Special Equipment

Both the tractor and semi-trailer are equipped with Westinghouse air brakes on all wheels, with the air compressor driven off the tractor engine. To make it unnecessary to purchase gasoline except at each end of its long overland runs, the tractor is equipped with two side bolster tanks having a combined capacity of 110 gal.

The tractor is also equipped with an unusual semicircular radiator grille guard mounted on top of the front bumper. It is familiarly called the "cow catcher" and is made of ⅛x2-in. steel bars, with the narrow edges of the bars set toward the front so that the guard will not prevent sufficient air from passing through to the cooling core of the radiator. The guard serves to protect the whole front end of the cab, as shown in the accompanying illustration of the unit.

Has Advertising Value

The combination has been dressed up in good taste to enhance its advertising value. Both the tractor and trailer body are painted red. The tractor and trailer wheels are also painted red, with aluminum rims.

The lettering on the trailer sides, front and rear is aluminum and white. The company name "Salley" on the trailer sides is painted in letters 3 ft. high. Also on the trailer sides at the front and rear ends are reproductions of flour bags bearing the company brand name "Red Fox." Each flour bag is approximately 6 ft. high.

The company name "Salley" is also painted on the rounded nose of the trailer, with the tops of the letters as close as possible to the bottom of the V-shaped roof line so that the name is visible above the top of the tractor cab to pedestrians or to drivers of other vehicles approaching from the front. The company name is also painted across the rear doors of the trailer, so that no matter from which direction the vehicle is seen, there can be no doubt that it is the Salley company's "big bruiser."

Nickel-plated hub caps on all wheels complete the dressing up of the equipment. Running lights, reflectors, tail and stop lights fitted in accordance with the ICC Motor Bureau's safety code complete the vehicle's equipment. An air horn mounted on the roof of the cab on the left hand side ensures that the unit's warning or passing signals will be heard under all traffic conditions.

Mushrooms growing in special beds which are kept cool in summer by refrigeration.

Methods for Quick Freezing And Dehydrating Mushrooms

By H. J. BRUNELL, W. B. ESSELEN, Jr., and F. P. GRIFFITHS
Horticultural Manufactures Department, Massachusetts State College, Amherst, Mass.

Commercially* grown mushrooms can be dehydrated so that they will compare favorably in flavor and in appearance with the fresh product. Quick freezing also yields a satisfactory and flavorful product. Vitamins are well retained.

THE purpose of this investigation was to study methods for the dehydration and quick freezing of commercially grown mushrooms (*Agaricus campestris*). Information was also obtained on the effect of these methods of preservation on the vitamin content of mushrooms.

Review of Literature

Dehydration of Mushrooms—Mushrooms have been dried in Europe and in the Orient for many years. Maule and Hannum (1935) reported that 455,791 lb. of dried mushrooms was imported into the United States from Europe in 1934. This type of mushroom is different from that grown commercially in this country. Herrmann (1919) discussed the sun drying of mushrooms.

Lambert (1941) reported that mushrooms could be successfully dried by being placed on trays over which was passed a rapid current of warm air. It was found that thoroughly dry mushrooms remained in good condition for several years if they were kept free from insects and were not exposed to moisture or high humidity.

Cruess and Mrak (1942) gave directions for the dehydration of mushrooms and recommended that they be blanched in steam for 5 to 10 minutes and dried at a temperature not exceeding 150 deg. F. They found that unblanched mushrooms were more attractive in appearance but were inferior in flavor to be blanched product.

Anderson and Fellers (1942) reported that unblanched mushrooms (*Agaricus campestris*) which were dehydrated at 135 deg. F. contained 11 micrograms per gram of thiamine, 48 micrograms per gram of riboflavin and 540 micrograms per gram of nicotinic acid.

Quick Freezing of Mushrooms—Tressler (1932) stated that mushrooms contain catalase and other oxidizing enzymes which must be inactivated prior to freezing. The darkening of mushrooms due to oxidizing enzymes was suggested as a method for determining whether or not the product had been sufficiently blanched.

Diehl, Pentzer, Berry and Asbury (1934) and Diehl, Weigand and Berry (1939) reported that mushrooms should be scalded in boiling water before freezing; button and small size for 2 minutes and large mushrooms for 3 to 4 minutes. Prompt and rapid cooling after scalding was recommended in order to retain the color of the product. The packing of mushrooms in a 2 percent brine sufficient to cover the product prevented oxidation.

Smart (1934) recommended blanching mushrooms in steam rather than in hot water. She also reported that mushrooms kept best when frozen in a 2 percent sugar solution. Von Loesecke (1942) stated that mushrooms should be blanched in steam for 2 to 4 minutes.

According to Tressler and Evers (1943) button mushrooms should be steamed 105 seconds and large mushrooms 3 to 4 minutes. The blanched product should be cooled in a 1 percent citric acid solution and then cold water. The mushrooms should be drained 15 to 20 minutes, packed in moistureproof packages, and frozen.

Dehydration of Mushrooms

Preparation of Material—Fresh commercially grown mushrooms were first washed in cold water until thoroughly clean. They were then left whole, sliced or cut into triangular pieces, using the

* Contribution No. 485, Massachusetts Agricultural Experiment Station, Amherst, Mass.

TABLE I—Time Required To Dehydrate Whole and Cut Mushrooms, at Different Temperatures, to a Moisture Content Under 5 Percent.

Dehydration temperature,* deg. F.	Cut mushrooms, hours	Small whole mushrooms, hours	Medium and large whole mushrooms, hours
130	17–20	.....	....
135	12–14	.....	....
140	10–12	.....	....
145	8–10	.....	....
150	7–8	16–18	20+
155	6–7	.....	....
160	6	.....	....
165	6	....	....
170	5–6	....	....

*Dry bulb temperature.

TABLE II—The Thiamine, Riboflavin, and Nicotinic Acid Content of Fresh and Dehydrated Mushrooms as Influenced by Blanching, Dehydration, and Storage for Five Months at 70-75 deg. F.

Length of storage, months	Condition of mushrooms	Thiamine Micrograms per gram	Thiamine Percent loss	Riboflavin Micrograms per gram	Riboflavin Percent loss	Nicotinic Acid Micrograms per gram	Nicotinic Acid Percent loss
0	Fresh (moist basis)	1.16	....	5.4	....	62.	....
0	Fresh (dry basis)	10.66	....	49.6	....	569.9	....
0	Dehydrated (dry basis)	8.82	17.3	49.0	1.3	501.	12.1
1	Dehydrated (dry basis)	8.80	17.5	48.2	2.8	506.	11.1
2	Dehydrated (dry basis)	8.75	17.8	50.0	+0.8	492.	13.7
3	Dehydrated (dry basis)	8.83	17.2	48.6	2.0	497.	12.7
4	Dehydrated (dry basis)	8.78	17.6	49.3	0.6	....	....
5	Dehydrated (dry basis)	8.75	17.8	48.0	3.2	....	....

TABLE III—The Thiamine, Riboflavin and Nicotinic Acid Content of Fresh and Frozen Mushrooms.

Length of storage, months	Condition of mushrooms	Thiamine Micrograms per gram	Thiamine Percent loss	Riboflavin Micrograms per gram	Riboflavin Percent loss	Nicotinic Acid Micrograms per gram*	Nicotinic Acid Percent loss
0	Fresh	1.16	....	5.40	...	62.	...
0	Frozen	1.00	13.8	5.20	3.7	56.5	8.8
1	Frozen	1.00	13.8	5.17	4.4	56.3	9.2
2	Frozen	0.97	16.3	5.22	3.3	56.6	8.7
3	Frozen	0.96	17.3	5.21	3.5	56.3	9.2

*Moist basis.

stem as a center of cutting. The small mushrooms or buttons were cut into four pieces and the medium- and large-sized mushrooms into six, eight or ten pieces. The cuts were made so as to keep the weight of the individual pieces uniform. The stems were cut off at the base. If they were soft or woody the stems were discarded, but if they were firm, they were sliced and dried with the rest of the mushroom.

The prepared mushrooms were pretreated in various ways prior to being dried in an effort to improve the quality of the finished product. The effect of blanching was observed by blanching in steam at 212 deg. F. for 2 minutes and 15 seconds. Tests were also conducted wherein the mushrooms were given various pretreatments before blanching as follows:

1. Five-minute dip in 3 percent sodium chloride solution.
2. Five-minute dip in 3 percent sodium chloride and 1 percent hydrochloric acid solution.
3. Five-minute dip in 3 percent sodium carbonate solution.
4. Five-minute dip in 1 percent citric acid solution.
5. Five-minute dip in 2 percent citric acid solution.
6. Five-minute dip in 3 percent citric acid solution.

With each treatment, control lots, both blanched and unblanched, were dehydrated.

Throughout this investigation all mushrooms were dehydrated in a forced draft, electrically heated, cabinet type of dehydrater as described by Davis, Esselen and Griffiths (1943).

Optimum Dehydration Temperature—In order to determine the optimum temperature for the dehydration of mushrooms, lots of both unblanched and blanched mushrooms were dehydrated at temperatures ranging from 130 to 170 deg. F. at intervals of 5 deg. F. The optimum dehydration temperature based upon drying time and the organoleptic qualities of the finished product was in the range of 145 to 150 deg. F. It was found that mushrooms dehydrated at a temperature above 150 deg. F. had a slight burned flavor. The mushrooms were considered dry when their moisture content had been reduced to below 5 percent. The experimental data are presented in Table I.

Effect of Pretreatments on Quality—The effect of various pretreatments on the quality of dehydrated mushrooms was determined by treating them as described above and dehydrating them at a temperature of 145 to 150 deg. F. The finished product was packed immediately into hermetically sealed glass containers and stored for five months at room temperature (70 to 75 deg. F.). The different samples of dehydrated mushrooms were reconstituted by soaking them in a small amount of water for an hour and then simmering until they were soft and tender. The experimental lots of mushrooms were examined for flavor and appearance and compared with fresh mushrooms prepared in the same manner.

Of the dehydrated mushrooms, those which were blanched without additional treatment had the best flavor. Those treated with a 1 percent citric acid solution were second best in flavor, and the unblanched dehydrated mushrooms were third in order of flavor. The first two methods yielded a product that compared favorably in flavor with fresh mushrooms.

The dehydrated mushrooms pretreated with the 2 and 3 percent citric acid solutions had a sour taste, while those pretreated by the other methods lost a large part of their flavor.

In appearance, the mushrooms pretreated with the 2 and 3 percent solutions of citric acid were the lightest in color, being almost white. The 1 percent citric acid treatment gave the next best appearing product and the mushrooms which were only blanched were third. The unblanched mushrooms were very dark in color. The other methods of pretreatment yielded mushrooms which varied in appearance between the blanched and the unblanched product.

Based on the above results it is recommended that mushrooms be blanched in steam, without additional pretreatment, prior to dehydration.

Vitamin Retention—During the course of this study, data were obtained on the retention of thiamine, riboflavin and nicotinic acid during the dehydration and storage of mushrooms. They were analyzed for these nutritive elements when fresh, immediately after dehydration and once a month for five months during storage at room temperature (70 to 75 deg. F.). The mushrooms were blanched in steam for 2 minutes and 15 seconds and dehydrated at 145 to 150 deg. F. The finished product was stored in hermetically sealed glass containers.

Thiamine was determined by the microbiological method of Williams, McMahan and Eakin (1941); riboflavin, by the microbiological method of Snell and Strong (1941), the extraction being done by the acid ether method of Strong and Carpenter (1942); and nicotinic acid, by the microbiological assay method of Snell and Wright (1941).

The data obtained in this study are presented in Table II. During the blanching and dehydration of mushrooms, the loss of thiamine was approximately 18 percent and that of nicotinic acid about 12 percent. It is probable that most of these losses occurred dur-

(Turn to page 140)

Removal of Oxidizing Factors Makes Dry Whole Milk Keep*

By C. D. DAHLE and D. V. JOSEPHSON, Dairy Department
Pennsylvania State College, State College, Pa.

Whole milk powder can be treated in processing so as to remove pro-oxidant constituents which make it subject to oxidized or tallowy flavor. The product then has excellent keeping qualities, should satisfactorily meet present requirements

THAT whole milk powder develops a stale oxidized flavor after some weeks or months of storage is a fact which has hindered this product from gaining wide acceptance. But the present war has focused attention again on dried whole milk because huge amounts are purchased by the military and Lend-Lease authorities. No doubt it will prove to be in great demand, even after actual fighting stops.

Homogenization of the fluid milk, gas packing and the use of higher processing temperatures have been used for years with some success to enhance the keeping quality. Yet dry whole milks still lack sufficient keeping quality. In order to be of the greatest possible use, it should keep for many months under adverse conditions.

The prevalent flavor defect observed is of an oxidative type, and the off-flavor product may be said to be stale, tallowy or oxidized. Oxidized flavor, which has received considerable attention in the past because of its prevalence in fluid milk, ice cream, frozen cream and fluid cream, was formerly thought to be due to oxidation of the butterfat, but it has now been shown definitely[1] to be due mainly to oxidation of the lecithin of the fat globule membrane rather than to oxidation of butterfat alone. The same may hold true for dry whole milk, although no reference has been made in the literature to this conjecture.

Dry whole milk has been shown to have antioxygenic properties when added to whole milk.[2] Yet, antioxidants have been added to whole milk before and after drying for the purpose of enhancing its keeping quality. Jack and Henderson[3] prevented the development of oxidized flavor in dry whole milk for approximately eight months by the addition of "Avenex No. 7," "Avenol" and ascorbic acid. They also found that powders made from milk preheated to 220 deg. F. kept for two years at room temperatures. Hollender and Tracy[4] also showed that antioxidants slightly improved the keeping quality of dried whole milk, and that milk preheated to 170 deg. F. for 30 minutes before drying was less likely to develop oxidized flavor than milk preheated at 150 deg. F. or 190 deg. F. Waite[5] also found that certain antioxidants helped delay oxidized flavor in dry whole milk. He used hydroquinone and oat flour.

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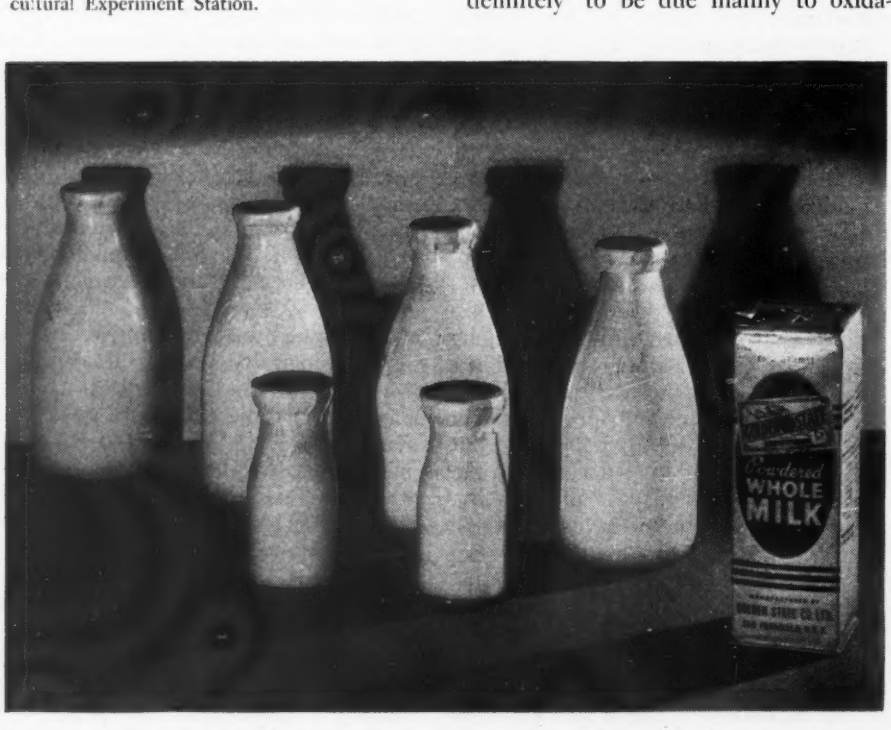

One container of powdered whole milk is the equivalent of 4½ quarts of fluid milk, and it is not highly perishable. Space and weight saving and keeping quality are important economic advantages.

Experimental

Assuming that lecithin may be a factor in the keeping quality, dry whole milk was prepared from milk in which the lecithin content was considerably reduced. Fresh milk was separated into cream and skim milk. The cream was cooled and churned into butter. The butter was melted and the oil separated from the curd and water by filtering. It was then washed and filtered several times. This fat was practically lecithin free. The skim milk resulting from the separation of the milk was divided into two parts. One part was passed through a supercentrifuge at 25,000 r.p.m. to remove part of the lecithin remaining in the skim milk. The following samples were prepared:

1. Fresh milk.
2. Pure butter oil and skim milk.
3. Pure butter oil and supercentrifuged skim milk.

These three samples were pasteurized

TABLE I—Effect of Removing Lecithin from Milk Upon Keeping Quality of Milk Powder.

(Samples stored at approximately 85 deg. F.)

Description of whole milk powder	Sealed in	Flavor after storage period of 1 month	2 months	3 months	5 months
Control	Air	Stale	Oxidized ++	Oxidized +++	Oxidized ++++
Skim milk plus butter oil	Air	Slightly stale	Oxidized +	Oxidized ++	Oxidized ++
Supercentrifuged skim milk plus butter oil	Air	Good	Very slightly stale	Stale	Very stale
Control	Nitrogen	Very slightly stale	Oxidized +	Oxidized ++	Oxidized +++
Skim milk plus butter oil	Nitrogen	Very slightly stale	Slightly stale	Oxidized +	Oxidized +
Supercentrifuged skim milk plus butter oil	Nitrogen	Good	Good	Slightly stale	Slightly stale

TABLE II—Lecithin Content of Whole Milk Powder Expressed as Percent Lecithin in Fatty Extract of Product.

Sample	Percent Lecithin
Control whole milk powder	0.753
Whole milk powder made from skim milk and butter oil	0.480
Whole milk powder made from supercentrifuged skim milk and butter oil	0.366

at 160 deg. F., homogenized at 2,500 lb. pressure, then concentrated in a stainless steel vacuum pan to a concentration of 2 to 1, and dried on a small atmospheric roller dryer. The temperature of the drums corresponds to a steam pressure of 25 lb.

The samples were stored at 85 deg. F. in 4-oz. plastic screw-top brown bottles. One-half of the samples were evacuated in a desiccator and then charged with nitrogen. The bottles were filled to overflowing, capped, and the caps dipped in paraffine to prevent entrance of air. The samples were examined at monthly intervals. They were reconstituted by means of a malted milk mixer and scored by two or three judges. The experiment was repeated on three sets of samples, with the results shown in Table I.

Discussion of Results

In Table I it will be observed that the samples containing the least lecithin had the best keeping quality. Even when the samples were packed under a nitrogen seal the flavors deteriorated considerably after five months' storage at 85 deg. F., except in the one containing the least amount of lecithin. This sample was only slightly stale.

That all of the lecithin was not removed by the treatment is indicated by the figures in Table II. It can be seen that over half the lecithin of the milk may be retained in the skim milk, and that centrifuging the skim milk removed some of it. The supercentrifuging may have removed some other pro-oxidant as well, since a great improvement in keeping quality was obtained with this treatment, although nearly one-half of the original skim milk lecithin still remained in the reconstituted milk. This phase of the work is being investigated further.

The possibility of producing a whole milk powder having excellent keeping qualities is evident from this work.

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Determining Moisture In Dehydrated Vegetables

(*Continued from page 65*)

fact that it is equipped with an automatic timer makes it a rather easy instrument to use.

The Hart moisture meter, which is based on electrical conductivity, is more or less independent of particle size. Large differences of temperature were found to have significant effects upon the readings obtained. It requires relatively small samples of approximately two to three grams, which need not be weighed. Determinations can be made in about one minute, and are accurate to approximately 0.25 to 0.50 percent. While the instrument must be calibrated for each vegetable, this is not a disadvantage, because frequent recalibration is not necessary. Usually the coarse grind will give satisfactory results. This instrument was found to be satisfactory, although some difficulty was encountered with potatoes, possibly because of the need of adjustment in the device itself. It is easy to operate, is desirable because of the speed with which results can be obtained, and is independent of a source of electric current because it operates by means of batteries.

The Steinlite moisture tester, which is based upon the radio-frequency impedance principle, requires a weighed sample, the volume of which must be the same for all lots of a given material. This equality of volume is achieved by means of a compressor controlled by a spacer, the use of which is very simple. In the use of this instrument, temperature is important, but correction factors can be employed to adjust the results to operating temperatures when necessary. Approximately the same number of particles must be in each sample to get comparable readings. The figures given in Table IV are based upon a coarse grind in the food chopper. In this way, results agreeing with the vacuum oven to about 0.25 to 0.5 percent were obtained. The only advantage of this is that one curve to a vegetable is required. However, it has been said that results checking the vacuum oven to about 0.20 percent can be obtained if separate curves for each different cut of each vegetable are prepared, and the vegetables tested when they are taken from the dryer and cooled, without grinding of any kind. This was done with the tester designed for whole grains. This would mean two curves for a vegetable that was cubed for one group of consumers and cut in some other fashion for other consumers. These calibration curves are essential, but they are not a great problem because constant rechecking is not necessary. This operation is really rather simple, and one can get good results in about two minutes to the sample, after the technic has been mastered. This instrument is very good where rapid and rather accurate results are desired.

In using each of the three rapid instruments, it is desirable to run two or three check samples and average the results to insure consistent results.

For practical use of these last two electrical instruments, more consistently satisfactory results can be obtained if there is set aside a room in the plant or laboratory that can be kept at a nearly constant temperature. This makes temperature corrections unnecessary.

Any one of the three instruments described can be used in determining the moisture content of dehydrated vegetables. Each one possesses its own special advantages.

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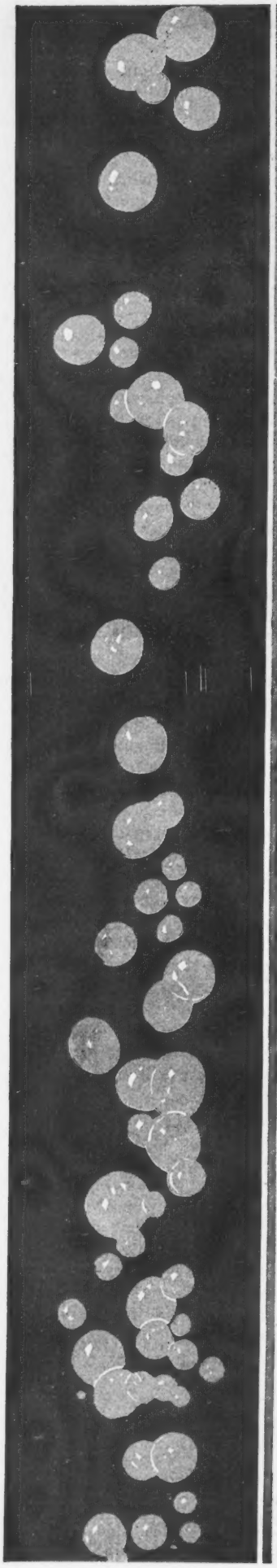

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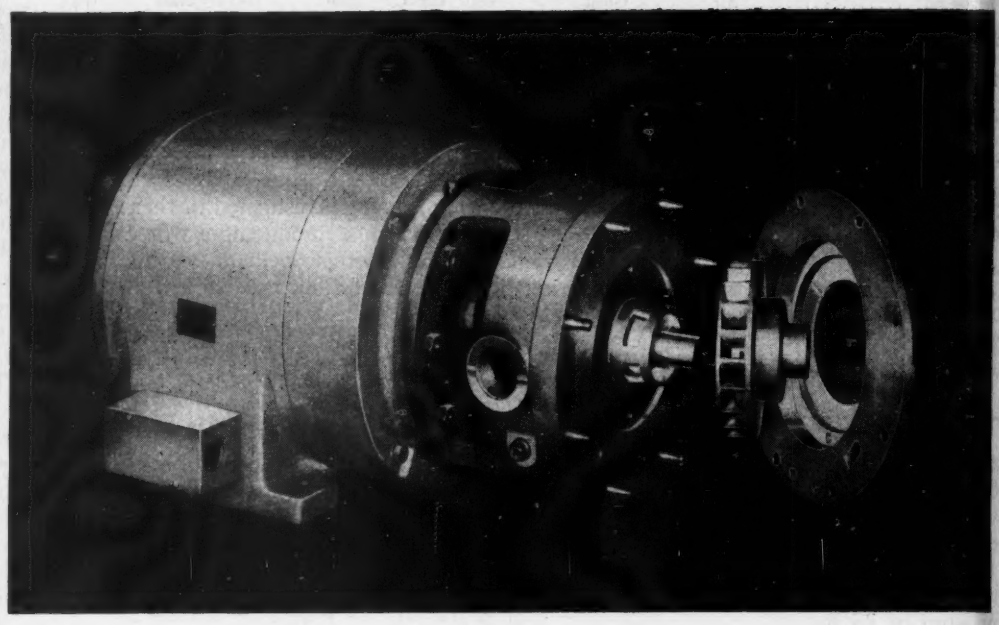

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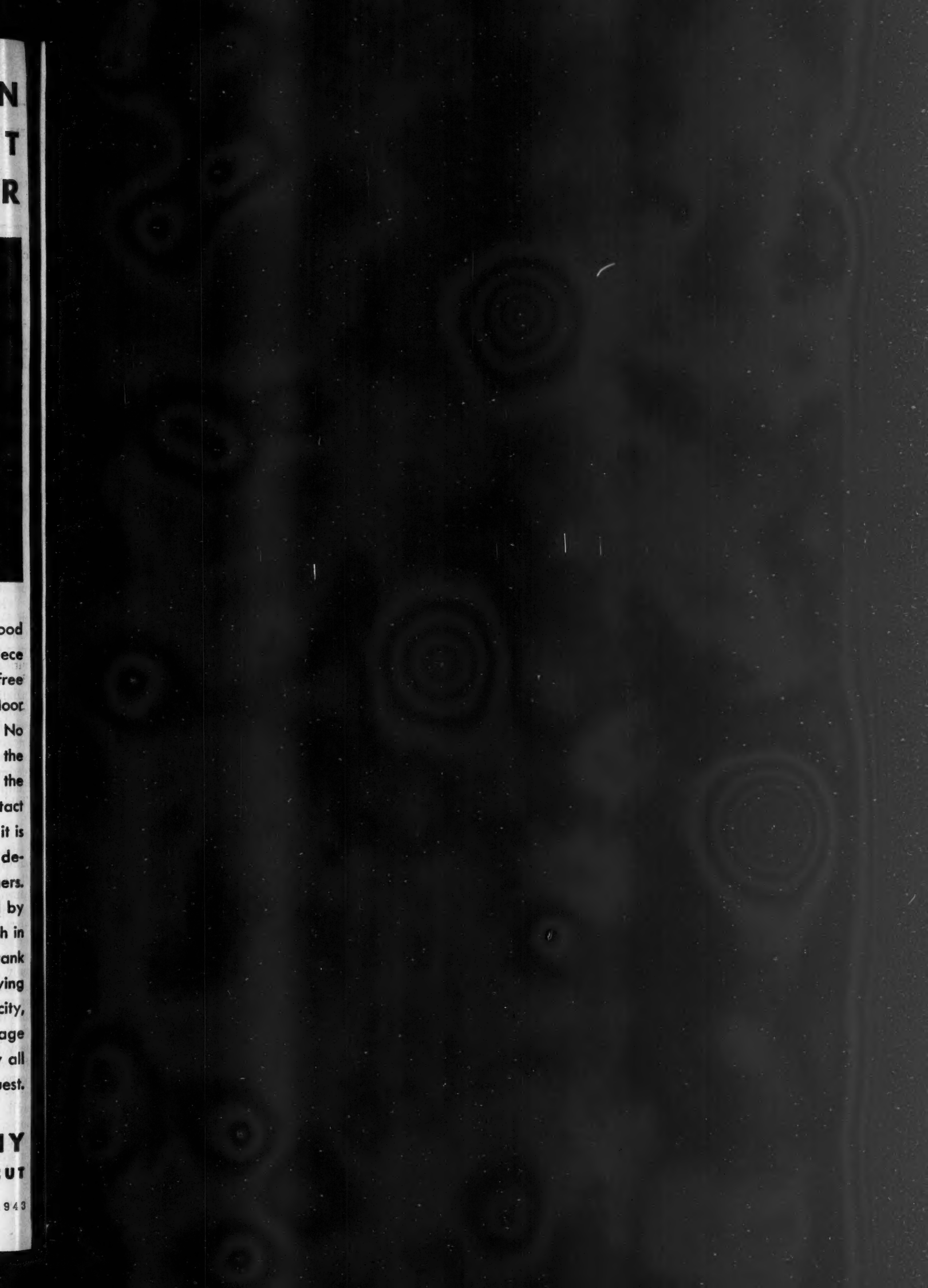
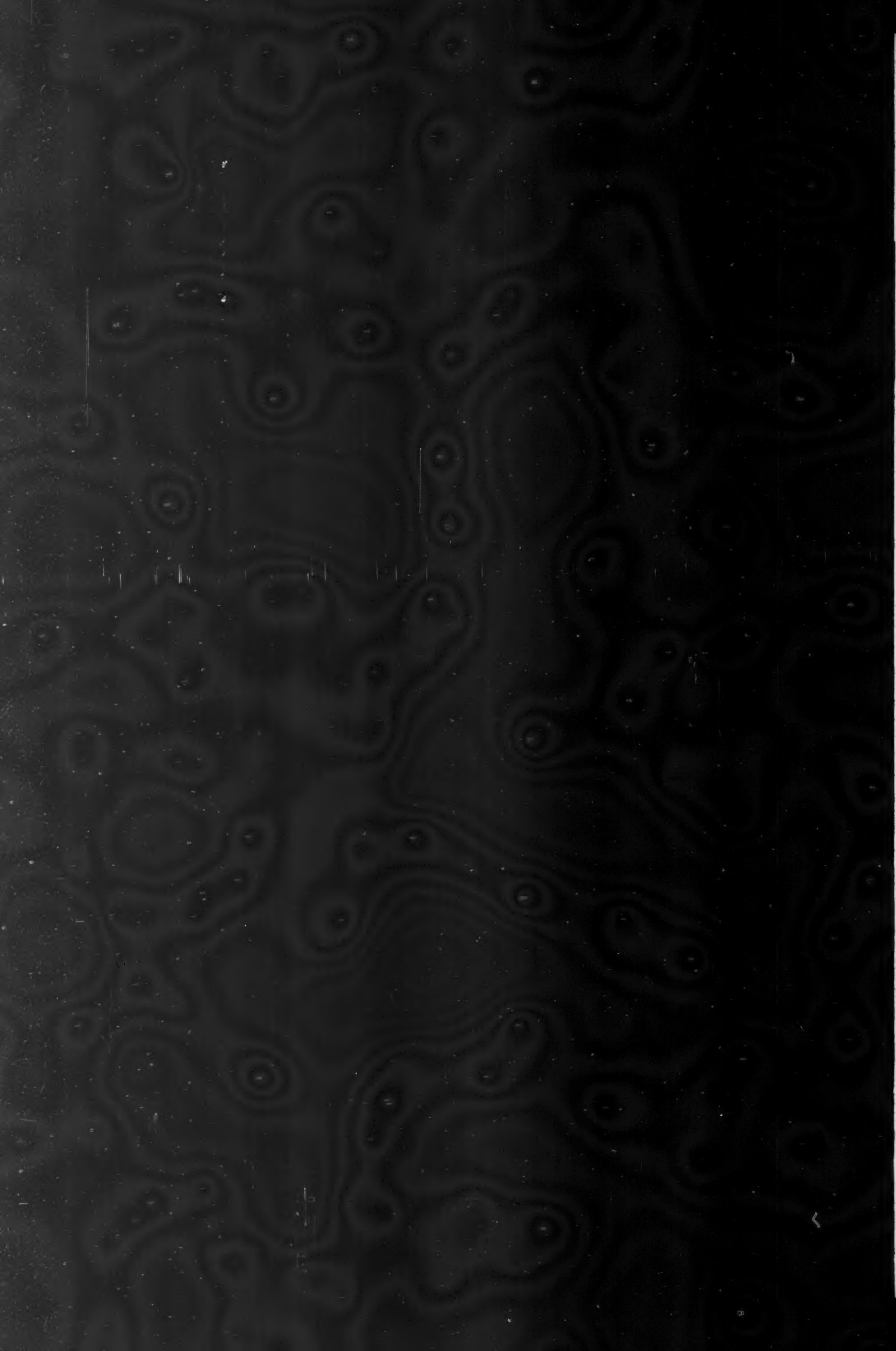
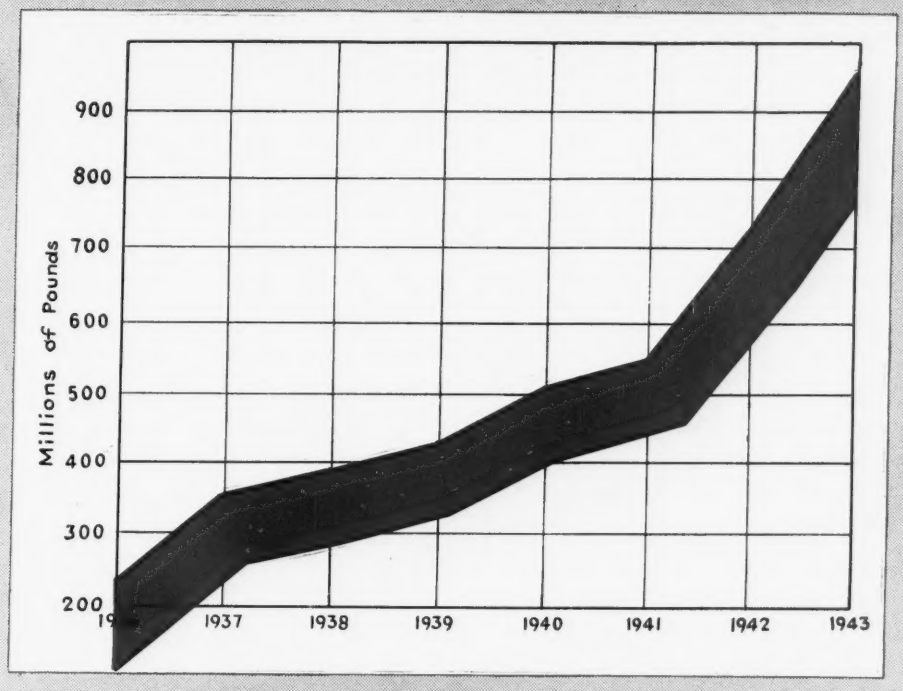




1943 EDITION

FROZEN FOODS DIRECTORY



UNDER the impetus of wartime demands and the expansion of capacity in many of the leading quick freezing plants, frozen food production has increased more rapidly in 1942 and 1943 than in recent years. This trend is indicated by the curve above. In 1942 the total pack of frozen foods in the United States is estimated at 730 million pounds, up about 35 percent from the preceding year. For 1943 the figure is 960 million pounds, an increase of more than 31 percent.

Indicating a rapidly developing new phase of quick freezing, the reports from four companies freezing cooked foods show a pack increasing from 516,000 lb. in 1942 to 6,950,000 lb. this year.

Reports on the output of quick frozen vegetables indicate a pack of 236 million pounds in 1942 and of 345 million pounds this year. Production of quick frozen fruits is placed at 103 million pounds in 1942 and 146 million in 1943, while the output of sharp frozen and cold packed fruits is 238 million and 259 million pounds for those years. The pack of quick frozen fish is placed at 72 million pounds last year and 87 million this year. The figures for quick frozen poultry are 73 million and 108 million, respectively; those for meat, 9 million and 13 million.

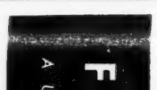
The production estimates shown on the above chart are somewhat lower than in the 1942 Directory for the years prior to 1943, the figures being adjusted in accordance with new information. It should be understood that really complete statistics on the pack of frozen foods are not as yet available, and the data given above are based upon the figures reported in the following table and upon figures from reliable sources for companies not reporting. The percentage increases were determined from the data for companies which reported packs for the three years 1941, 1942 and 1943.

It should be noted that the data do not cover meat frozen for storage, frozen eggs, uneviscerated frozen poultry, nor fish frozen in bulk. Nor do they include the food frozen in 4,600 locker plants handling about half a billion pounds a year.

FROZEN FOODS DIRECTORY

The companies listed in this directory are engaged in the freezing of fruits, vegetables, meat, fish and poultry for the commercial market. Some major distributors which contract for their output and have their own brands are listed because they are important factors in the industry. Locker plants are not included, nor are the commercial plants freezing eggs or those freezing poultry, meat or fish for storage or shipment.

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Armour & Co. Union Stock Yards, Chicago, Ill.	Des Moines, Iowa; Minneapolis, Minn.; Fort worth, Tex.	Cloverbloom, Gold Band	Poultry (completely dressed)	Various types, including transparent wrapping and paper-board cartons	Sharp freezer	.....	.....	.....
The Atlantic Coast Fisheries Co. 4 Fish Pier, Boston, Mass.	Provincetown, Boston, Gloucester, Mass.; St. Johns, Newfoundland	Nordic, Atco, Atlanco, Frigidsea	Seafoods	.....	Hurricane; sharp freezer; Jackstone	8,000,000	.....	.....
Barnes & Fisher. Sodus, N. Y.	Webster, Williamson, Wallington, N. Y.	Barnes & Fisher	Strawberries, cherries, prunes, cherry juice	Tins, 30 lb.	Air blast	2,000,000	2,000,000	700,000
Baumer Food Product Co. 4300 Tulane Ave., New Orleans, La.	New Orleans, La.	Crystal	Strawberries	30-lb. containers and barrels	Sharp freezer	1,750,000	35,000 (Remainder preserved in SO_2)	875,000
H. C. Baxter & Bro. Brunswick, Me.	Corinna, Portland, Me.	Birds Eye	Peas, French-style green beans, cut wax beans, blueberries, corn on the cob, whole-kernel corn, oven baked beans	Cartons, cellophane lined	Birds Eye	Pack only for	Frosted Foods	Sales Corp
Bellevue Creamery & Produce Co. 8th & Farnam St., Omaha, Neb.	Omaha, Neb.	Ocoma, Mayfair	Dressed poultry	.....	Blast freezing, 15 deg. below zero	12,000,000	12,000,000	.....
Bluepoints Co., Inc. West Sayville, N. Y.	West Sayville, N. Y., Cambridge, Md.	Bluepoints, Bluepoints Bay Oysters, Sealshipt	Oysters, swellfish, sea robins	Oysters: 4-lb. Peters bleached sulphite board cartons 10x5x2⅛ in., cellophane lined, wax-paper wrap. Swellfish and sea robins: 15-lb. wax-coated sulphite board folding cartons, cellophane lined and wrapped to give three 5-lb. blocks per carton, 15x10¾x2⅞ in.	Birds Eye	20,000	30,000	106,000
Bob White Quality Frosted Foods Corp. 54 North Fifth St., Reading, Pa. (Principally a distributor)	Reading, Pa.	Bob White	Handles full line of vegetables, fruits, citrus juices, fish, poultry	Cartons, 10, 12, 14 oz.; 1, 2½, 5, 20 lb.	Sharp freezer	250,000	250,000	300,000
R. D. Bodle Co. 71 Spring St., Seattle, Wash.	Seattle, Lynden, Kent, Puyallup, Tacoma, Wash.; Portland, Hillsboro, Ore.	Bodle's Totem	Strawberries, blackberries, youngberries, red raspberries, loganberries, black raspberries, gooseberries, huckleberries, olympic berries, boysenberries, peaches, prunes, apricots, rhubarb, cherries, (sweet and sour), asparagus, broccoli, peas and carrots, cauliflower, corn on cob, whole-kernel corn, peas, green beans, wax beans, lima beans, spinach, cooked squash, brussels sprouts, succotash, zucchini	Cartons: Transparent-cellulose lined, 10, 12, 13, 16 oz.; 2½, 5, 10 lb. Tins: 10, 15, 30, 50 lb. Fiber cartons: 30, 32, 40 lb. Wood barrels: 50-gal.	Various, as best suited to the product	23,000,000	.....	.....
Booth Fisheries Corp. 309 West Jackson Blvd., Chicago, Ill.	Boston, Chicago, Dallas, St. Louis, Seattle, Winnipeg	Booth, Tastyloins	All varieties of fish and seafoods; fruits and vegetables	Sulphite board, transparent wrappers, 1, 5 lb.	Cooke	.....	.....	.....
Bowes Co., Ltd. 76 Front St., E. Toronto, Ont., Canada	Toronto, Canada	Bowes	Strawberries, raspberries, cherries, blueberries, apples	Tin, wood containers, 20 to 40 lb.	Sharp freezer, 10 deg. below zero	700,000	200,000	250,000
Bozeman Canning Co. Mount Vernon, Wash.	Monroe, Waitsburg, Wash.; Santa Clara, Calif.	Pict Sweet, Frigifood, Goodyear	Vegetables: Peas, peas and carrots, carrots, corn, Blue Lake beans, Fordhook limas, Henderson limas, Clark limas, spinach, asparagus, broccoli, cauliflower, squash, kale, brussels sprouts, beets. Fruits: Strawberries, apricots, peaches	10 and 12 oz.; 1, 2, 2½, 3, 5, 25, 30 and 50 lb.	Air blast; belt and package tunnels	5,000,000	5,500,000	10,000,000
Brookfield Creamery, Ltd. Truro, N. S., Canada	Truro, N. S.	Brookfield, Colchester	Poultry	Cartons, 6 and 12 birds to a pack	Sharp freezer; air blast, 20 deg. below zero	83,000	76,335	50,000
Brown Packing Co. Christian & Howard Sts., Philadelphia, Pa.	Philadelphia, Pa.; Plant City, Fla.; St. Louis, Mo.; Shelby, Mich.	Brown's Select	Apples (sliced), blackberries, RSP cherries, peaches (yellow and white), pineapple, plums, pumpkin, raspberries (black and red), strawberries, pineapple-coconut, tangerines, pineapple-tangerine, cranberry puree, plum puree, grape puree, strawberry puree, apricot puree, black and red raspberry puree, bananas, huckleberries, blueberries. Also carry a complete line of frozen vegetables.	Cartons, waxed, with vegetable parchment liner, 5, 10 lb.; cans, enamel lined, 10, 15, 30, 35, 38, 40, 50, 55, 60 lb.; kegs, 10, 15 gal.; barrels, 40, 50 gal. Vegetables in 2½, 5-lb. containers	Air blast at sub-zero temperature for small packages; sharp freezer for bulk containers	7,500,000	5,500,000	.....



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When you want facts on materials, equipment and supplies

SECTION 1 — *Catalog Section* — Turn to section One — here is manufacturers' catalog information, picturing and describing products of leading suppliers. Here are sizes, speeds, capacities—definite performance data giving you the detailed information you need.

When you need new food formulas or processing information

SECTION 2 — *Reference Section* — Here is a collection of over 200 food formulas for all varieties of food products reprinted from FOOD INDUSTRIES. Food plant engineers find particular interest in the Flow Sheets which graphically show preparation, processing and packaging of a wide variety of foods.

When you want to find who makes a certain product

SECTION 3 — *Classified Directory of Manufacturers* — Here is a list of manufacturers of machinery, equipment and supplies. Names classified alphabetically by product, with catalogers names in bold face type, giving page reference to the catalog section. You will find more than 500 products used in the processing of food. In using this section look for the principal word such as "Filters", "Mixers", etc.

When you want to locate a certain manufacturer

SECTION 4 — *Alphabetical Company Name, Address, and Trade Name Index* — A complete listing of the companies making the products listed in Section 3. This is the cross index that simplifies the use of the book.

● The new Sixth Edition of Food Industries Catalogs & Directory will soon be distributed to more than 12,000 processing and production engineers and executives in important food plants.

You will find this *quick* and *comprehensive* reference book of value when:

planning new equipment or material purchases
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replacing obsolete equipment
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searching for engineering help
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or in the dozen and one problems that beset food men in these days of record breaking production under war-time handicaps and pressure.

Please be on the look-out for your copy and see that it is available to all the people in your plant that it can help.

FOOD INDUSTRIES CATALOGS & DIRECTORY

A UNIT OF CATALOG AND DIRECTORY DIVISION • McGRAW-HILL PUBLISHING CO., 330 W. 42nd ST., NEW YORK 18, N. Y.

BOOTH ADOPTS CELLOPHANE BAG-IN-BOX

for Bulk Packs of Frozen Foods

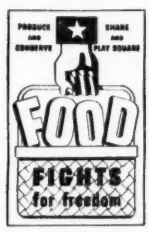
PROFITING from the long experience that Booth Corporation has had with the use of Cellophane as a protective packaging for Frozen Foods, they have now adopted the latest improvement of the Cellophane bag-in-box container for their 30-pound bulk packs of frozen strawberries, cherries, peaches, pineapples and other fruits. They report it is a very satisfactory metal replacement.

- The tough bag of laminated Cellophane gives the fullest measure of protection for the contents. The sturdy fibre board carton provides the necessary structural strength.
- This new unit is easy to handle in all production operations—filling, freezing and defrosting. Its shape saves space in storage and shipping.

If you have a metal replacement problem on frozen foods, perhaps the Cellophane bag-in-box may prove the answer. Just write to E. I. du Pont de Nemours & Co. (Inc.), Cellophane Division, Wilmington 98, Delaware.

DU PONT
REG. U. S. PAT. OFF.

Cellophane



BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
California Consumers Corp. 230 W. Jefferson Blvd., Los Angeles 7, Calif.	Pasadena, Calif.	Vegetables: Prime Frozen, Spray Kist, Full Tide, Green Tide. Juices: Trujuis, Real Juis, Pure Frozen	Citrus Juices: Orange, lemon, grapefruit. Vegetables: Lima beans, sprouts, broccoli, cauliflower, spinach, asparagus, string beans, rhubarb, berries. Fish, poultry, meats	Cartons, waxed, cellophane wrapped, lid applied, then overwrap of wax paper (5 lb., 2½ lb., 12 oz.)	Tunnel; cabinets; Finnegan tubes for juices. 35 deg. F. below zero.	11,000,000	22,750,000	.....
California Fruit Growers Exchange. Products Department, Ontario, Calif.	Ontario, Corona, Calif.	Exchange	Orange and lemon juice	.....	.....	.....	.....	.....
Canada Packers, Ltd. Toronto, Ont., Canada	Brantford, Ont.; Quebec, Que.; Charlottetown, P. E. I., Canada	Maple Leaf (blueberries) York (all other)	Asparagus, spinach, peas, corn, cauliflower, brussels sprouts, beans, squash, broccoli, blueberries, raspberries, strawberries, cherries, rhubarb	12 and 16 oz.; 2, 2½ lb.; 15, 30-lb. bulk	Air blast and sharp freezer	.....	.....	.....
H. P. Cannon & Son, Inc. Bridgeville, Del.	.....	.....	Squash	.....	Finnegan	.....	.....	Limited quantity
Carpenter Squab Ranch. R. 1, Box 412, La Canada, Calif.	Los Angeles, Calif. (National Ice & Cold Storage Co.)	Carpenter Squab Ranch	Squabs	Wooden boxes, with asphalt liner paper bags to fit. (12 squabs to a box)	Sharp freezer	12,000	10,000	None
Cascade Frozen Foods, Inc. 2202 First Ave., South Seattle 4, Wash.	Burlington, Kennewick, Everett, Seattle, Wash.	Jack Frost, Agen's Quick Freeze, Arctic Lad, Jack Arctic	Vegetables: Asparagus, peas, cauliflower, brussels sprouts, broccoli, string beans, corn, carrots, lima beans, spinach. Fruits: Peaches, strawberries, raspberries, boysenberries, blackberries, cherries	Tins, 30 lb.; Bulkans, 30 lb.; barrels	Air blast	5,700,622	5,117,740	6,500,000
Cedergreen Frozen Pack Corp. Wenatchee, Wash.	Wenatchee, Wash.	Cedergreen, Flav-r-Pac	Vegetables: Asparagus, green beans, wax beans, broccoli, brussels sprouts, cauliflower, carrots, corn, lima beans, peas, peas and carrots, spinach, squash, pea puree. Fruits: Apples, apricots, blackberries, boysenberries, R.S.P. cherries, loganberries, peaches, peach puree, prunes, raspberries, strawberries, youngberries	Open-end white patented coated solid manila, cellophane liner, 10, 12 oz., 1, 2, 2½, 4, 5, 10 lb.; top-opening high-speed white patented coated solid manila, 10, 12 oz.; 1, 2, 2½, 4, 5 lb.; solid fiberboard telescope cases, 15, 30 lb.; solid fiber cases, cellophane lined, 30 lb.	Air blast	4,698,000	6,027,000	8,250,000
Cherry Products Co., Inc. Denver and Loveland, Colo.	Denver, Colo.	Meadow Gold	Cherries	Tins, 30, 50 lb. Cartons with waterproof liner; barrels, 50 gal.	.....	1,922,024	1,727,958	1,546,497
Cherry Valley Canners. Picton, Ont., Canada	Toronto, Canada	Cherry Valley	Cherries, strawberries, raspberries	Pails, 22 lb.; barrels, 40 gal.	.....	.....	.....	.....
Chickamauga Producers, Inc. Cleveland, Tenn.	Cleveland, Dayton, Tenn.	Chickamauga	Strawberries, youngberries, blackberries, peaches, cut green beans, cut corn, broccoli, spinach, apples, chickens, turnip greens	Barrels, 400 lb.; tins, 30 lb.; containers, 2½, 5, 10 lb.	Tunnel	200,000	1,000,000	2,000,000
Cincinnati Fruit & Extract Works. 422 W. Fourth St., Cincinnati, Ohio	Hammond, La.; Traverse City, Mich.; Cincinnati, Ohio; Seattle, Wash.	Reyam	Strawberries, red raspberries, black raspberries, peaches, cherry juice	Wood barrels, 50 gal. Cartons, 30 lb.	Sharp freezer	300,000	150,000	200,000
Clydekraut Co. Clyde, Ohio	Toledo, Cleveland, Ohio. (Public storage)	Silver Fleece	R.S.P. cherries	10, 15, 30 lb.	Zero temperature	400,000	350,000	None
Comstock Canning Corp. 203 W. Miller St., Newark, N. Y.	East Pembroke, Marion, N. Y.	Comstocks	Apples, snap beans, cherries, corn, peas	Paper boxes, cellophane lined, 12 oz.; 40 oz.; waxed-paper lined, 5 lb. Bags, 30 lb. Tins, 30 lb.	Finnegan (at East Pembroke); Sharp freezer (at Marion)	1,463,445	4,141,392	4,517,370
Consumers Packing Co. Plum & Liberty Sts., Lancaster, Pa.	Lancaster, Pa.	Consumers	Strawberries, spinach, asparagus, peas, snap beans, lima beans, corn, apples	Cartons, waxed, with cellophane bag and waxed wrapper, 10, 12 oz., 2½ lb.; kraft corrugated boxes with bags, 25, 30 lb.	Air blast, 20 deg. below zero	130,000	170,000	910,000
Coryell Commercial Center. Lincoln, Neb.	Lincoln, Neb.	Coryell —70—	Peas, corn (kernel and cob), carrots, string beans, cherries, peaches, strawberries. All kinds of meat and poultry	Pint, quart, and ½-gal. containers	Sharp freezer	.....	.....	.....
T. W. Crocker Co., Ltd. Newcastle, N. B., Canada	Newcastle, N. B.	"C"	Salmon, shad, mackerel, smelts, tomcods, eels, herring. Blueberries	Blueberries, 30-lb. boxes with waxed paper lining. Smelts, 10–15-lb. boxes. All other fish, 50–100–, 150-lb. boxes	Sharp freezer, 10–20 deg. below zero	590,000	563,800	660,000
Crozet Cold Storage Corp. Crozet, Va.	Crozet, Va.	Crozet	Apples, peaches, snap beans, small fruits	30-lb. Sealright Bulkans	Air blast, 15 to 20 deg. below zero	650,000	1,700,000	1,900,000
Cudahy Packing Co. 221 N. La Salle St., Chicago, Ill.	Omaha, Neb.; Kansas City, Wichita, Kan.; Sioux City, Ia.; St. Paul, Minn.	Purian, Select	Meats only	Tin or paper pails, 5, 10 lb.	Sharp freezer	.....	.....	.....
Curtice Brothers Co. 20 Curtice St., Rochester, N. Y.	Brockport, N. Y.	Blue Label	Peas, corn, snap beans, beets, carrots, lima beans, apples	Cartons, end-opening with inner bag, 12 oz., 2½ and 5 lb.; Bags, 35, 50 lb.	Finnegan	.....	.....	.....

FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Davis-Cleaver Produce Co. 235 N. Fourth St., Quincy, Ill.	Quincy, Ill.	Ferndale	Poultry	Wood boxes; birds cellophane wrapped	Air blast, 20 deg. below zero	400,000	741,240	2,500,000
Deerfield Packing Corp. Bridgeton, N. J.	Bridgeton, N. J.	Buyers label only	Apples, asparagus, beets, blueberries, broccoli, brussels sprouts, carrots, cauliflower, corn, Fordhook beans, green beans, kale, lima beans, peas, peppers, spinach, squash, wax beans, cranberries, succotash and peas and carrots	Cartons, 10, 12, 14, 16 oz. for retail distribution; 2½, 5 lb. for institutions; bulk pack, 20, 50 lb. loose; 10-lb. bricks for manufacturers	Birds Eye, Murphy-Seabrook	50,000,000	.....	.....
Delnor Frosted Foods, Ltd. New Westminster, B. C., Canada	New Westminster, B. C.	Delnor	Fruits: Strawberries, raspberries, loganberries, blueberries, boysenberries, blackberries, rhubarb, apricots, peaches, cantaloupe. Vegetables: Peas, green beans, spinach, asparagus, corn kernels, corn on cob, peppers	Vegetables: 12 oz., 2½ and 5 lb., double-coated waxed carton with waxed overwrap. Fruit, 1-lb. Mono cups	Air blast, 10 deg. below zero	4,000,000	.....	.....
Dixie Frosted Foods. First National Bank Bldg., Birmingham 3, Ala.	Georgiana, Ala.	Dixie Frosted	Strawberries, peaches, corn, peas, limas	5- and 30-lb. containers. Few barrels of strawberries	TVA Immersion; Burge Spot, air blast	750,000	1,200,000	3,500,000
Dorset Foods, Ltd. 44–02 23rd St., Long Island City, N. Y.	Long Island City, N. Y.	Dorset De Luxe	Chicken a la king, corned beef hash	.....	.....	.....	.....	.....
John H. Dulany & Son. Fruitland, Md.	Exmore, Va.	Dulany	Vegetables: Asparagus, broccoli, brussels sprouts, cauliflower, corn, green beans, wax beans, lima beans, peas, peas and carrots, pumpkin, spinach, squash, succotash, mixed vegetables. Fruits: Strawberries, blueberries, cherries, peaches, pineapple, raspberries, orange juice, fruit cup. Seafood: Mackerel, shad, haddock, perch, flounder, shad roe, soft-shell crabs, crab meat, shrimp (cooked, seasoned and deveined), shrimp (uncooked), scallops, clams, oysters. Poultry.	Packages, 8, 10, 12, 16 oz.; 2, 2½, 5 lb. Tins, 10, 15, 30, 50 lb.	Finnegan	.....	.....	.....
Elyria Canning Co. Elyria, Ohio	Elyria, Cleveland, Ohio	Moss Rose	Strawberries, raspberries, currants, elderberries, rhubarb, cherries, plums, prunes	Cans, 10, 15, 30 lb.; barrels	Sharp freezer, 10 deg. below zero	.....	.....	280,000
William F. Endress, Inc. 66 Foote Ave., Jamestown, N. Y.	Jamestown, N. Y.	Field Fresh	Peas, strawberries, peaches, cherries, prune plums, grapes	30-lb. tins; 50-lb. fiber cartons; barrels	Sharp freezer (air blast)	1,500,000	1,500,000	None
Epperson & Sons. 806 37th Ave., Seattle, Wash.	Sumner, Sedro, Wooley, Wash.	Epperson & Sons	Berries, RS cherries, rhubarb	Cartons, 30 lb.; barrels, 50 gal.	.....	540,000	.....	.....
F. and M. Packing Co. Traverse City, Mich.	Traverse City, Mich.	None	RSP Cherries	Tins, 30 and 50 lb.; wood barrels, 450 lb.	Circulating ammonia, 25 deg. below zero	1,500,000	1,250,000	550,000
Fainer Frozen Foods. 915 South Arroyo Parkway, P. O. Box 789, Pasadena 19, Calif.	Pasadena, Calif.	Magic Meals	Beans (Boston-style), chili beans, spaghetti, spaghetti sauce, vegetable soup, bean soup and split pea soup	Chipboard Menasha carton, 1 lb.; cellophane bags, 10 lb.	Air blast and contact, 25 deg. below zero	.....	100,000	5,500,000
Fairmont Canning Co. Fairmont, Minn.	Fairmont, Winnebago, Waseca, Madelia, Minn.	Frigidettes	Peas, corn, lima beans, squash	Cartons, 12 oz., 2½ lb.; 5 lb.; 30 lb.	Tunnel (air blast), Birds Eye	4,500,000	6,750,000	8,000,000
Farm Bureau Fruit Products Co. 221 North Cedar St., Lansing, Mich.	Coloma, Hart, Essexville, Mich.	Honest George	Berries, cherries, apples, asparagus, rhubarb, Concord grapes	Barrels; tins, 30, 50 lb.; cartons, 20, 30 lb.; boxes, 4 lb.	Sharp freezer	1,170,000	1,123,000	2,500,000
Chas. Feller. 738 N. Front St., Marshfield, Ore.	Marshfield, Ore.	None	Fish	Bulk	Sharp freezer	137,000	.....	.....
Florence Fish & Oyster Co. 206 North Irby St., Florence, S. C.	Florence, S. C.	None	Fish and sea foods	Cakes, 25 lb.; boxes, 100 lb.	Sharp freezer	1,000,000	1,000,000	1,500,000
Florida Quick Freeze & Cold Storage Co. 845 N. W. 71st St., Miami, Fla.	Miami, Fla.	None	Fish, frog legs, crawfish, shrimp, fruit juices	5 and 10 lb. packages for seafood and 1 qt. containers for liquids with cellophane or waxed paper liners	Air blast, 2 Frick blizzard freezers (daily capacity—30,000 lb.)	.....	.....	.....
W. H. Foley. Sodus, N. Y.	Sodus, N. Y.	Sodus Bay	RSP cherries	Tins, 30 and 50 lb.; barrels, 450 lb.	Cold pack, zero to 20 deg. below	.....	.....	.....
Food Associates, Inc. 255 Empire Bldg., Seattle, Wash.; 210 California St., San Francisco, Calif. (Sales agent, does not pack)	San Francisco, Calif.; Seattle, Marysville, Wash.	Frostcraft, Kwikway	Strawberries, peaches, raspberries, loganberries, youngberries, blackberries, boysenberries, olympic berries, prunes, apples, apricots, gooseberries, rhubarb, figs, fruit puree, artichokes, asparagus, green beans, lima beans, cauliflower, brussels sprouts, spinach, peas, cut corn, cob corn, broccoli, peas and carrots	.....	.....	.....	.....	.....
40-Fathom Fish, Inc. Boston, Mass.	Boston	40-Fathom	Haddock, sole, cod, scallops, swordfish, flounder, halibut, salmon, mackerel, other seafood	Individual pack	Birds Eye	.....	.....	.....
Fraser Valley Growers, Ltd. Mission City, B. C., Canada	Mission City, B. C.	Heart O'the Valley	Strawberries, raspberries, (black and red), currants, gooseberries, blackberries, loganberries, boysenberries	Barrels, 40 gal	Sharp freezer	165,311	175,000	.....

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Refrigerated Food Delivery

Fleets of trailer-trucks, equipped with special refrigerating units and hauling literal mountains of frozen foods, will increase in number. And tomorrow refrigerated cargo planes also will speed frozen foods over the skyways of the world.

Universal Cooler's continued participation in the development of equipment for frozen food deliveries will be based on fact . . . the design and production of dependable 2-temperature units for military cold storage warehouses from Alaska to Africa; rugged, portable units to help provide frozen foods for front line fighters on world-wide battlefronts. In addition, Universal Cooler designed and produced the complete refrigerating systems now in use on Army food trucks which are traveling the Alaska Military Highway.

Our expanded research-engineering-manufacturing facilities are at your disposal *now,* so, "LET'S ASK UNIVERSAL COOLER"! That's the way many equipment manufacturers, busy with post-war plans, are finding a reliable answer to their frozen food refrigeration problems.

REFRIGERATION IS OUR BUSINESS

UNIVERSAL COOLER

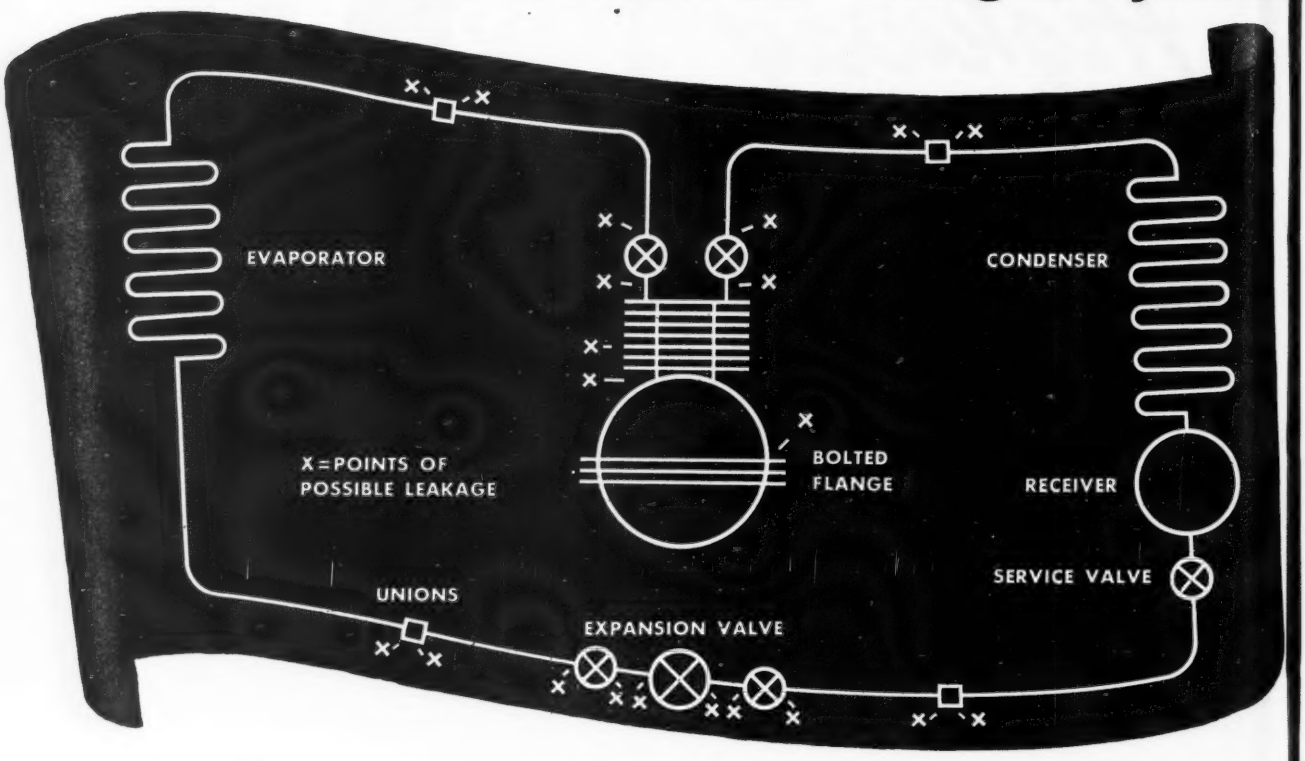
WE SELL TO MANUFACTURERS ONLY

UNIVERSAL COOLER CORPORATION • *Automatic Refrigeration since 1922*

MARION, OHIO • BRANTFORD, ONTARIO

MAINTENANCE TIPS

for "FREON-12" charged Systems



NO. 1

LEAK DETECTION
and correction

General Search for Leaks. Leaks in refrigerating systems, particularly small ones, are often difficult to detect. Look for leaks at unions; at flanges where bolted together; at cylinder heads and valve plates; on either side of valves, fittings, gaskets and threaded connections. Time can often be saved by looking for an accumulation of lubricating oil which has leaked from the system.

Locating the Leak. Use a Halide lamp to detect and positively locate the leak. When testing, the "Freon-12" vapor escaping from the leak will cause the high temperature flame of the lamp to change to a bright green color. Use of the Halide lamp is the easiest and best method of detecting the most minute leaks.

To Isolate and Repair Leak. Close valves on both sides of leak, thus isolating it; relieve pressure in line by "cracking" or loosening the nearest connection, and remove gas from line to be repaired by blowing it out with air. Repair leak according to the problem at hand.

To Test Repaired Leak. Fill repaired section with inert gas, such as CO_2 or nitrogen, under pressure. Use about 10% "Freon-12" as a "tracer" and test with Halide lamp as covered in detection. Don't use compressor to develop air pressure in line. For accurate testing, avoid lighting Halide torch in the room if filled with "Freon" vapor. Don't fill test lamp with fuel in a room containing "Freon." The fuel will absorb the gas and give inaccurate readings. Kinetic Chemicals, Inc., Tenth & Market Sts., Wilmington, Del.

NOTE: *This method of leak detection applies only to the "Freon" refrigerants.*

★

BUY A WAR BOND EVERY MONTH

KINETIC
FREON
REG. U. S. PAT. OFF.
safe refrigerants
"Freon" is Kinetic's registered trade mark for its fluorine refrigerants

FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Fresh Frozen Foods Corp. Watsonville, Calif.	Watsonville, Fresno, Sacramento, Calif.	Chilled-Quick	Boysenberries, youngberries, strawberries, apricots, carrots, beets, corn, cauliflower, spinach, broccoli, tomatoes, pumpkin	Cartons, 20 and 25 lb.	Quick freezing	500,000	2,000,000	.....
Friend Brothers, Inc. 407 Main St., Melrose, Mass.	Boston, Mass. (Quincy Market Cold Storage)	Friend's	Baked beans	Fiber can with cellophane liner, 1 pt.; contents 1 lb.	Air blast	None	316,058	1,089,641
Frigid Food Products, Inc. 1599 E. Warren Ave., Detroit, Mich.	Detroit, Mich.; Cleveland, Ohio; St. Louis, Mo.	Frigid-fruit	Apples, blackberries, blueberries, boysenberries, cherries, gooseberries, Concord grapes, peaches, rhubarb, pineapple, Italian plums, raspberries (red and black), raspberry puree (red and black), strawberries	Sealright cups, cellophane liner, 1 lb.; sealright tubs, cellophane liner, 5 lb.; cartons, fiber containers with laminated cellophane liners, 30 lb.	Sharp freezer, 20 deg. below zero	16,000,000	20,000,000	30,000,000
Frosted Foods Sales Corp. 250 Park Ave., New York, N. Y.	San Jose, Pasadena, Calif.; Corinna, Houlton, Me.; Pokomoke, Md.; Boston, Mass.; Medina, Mount Morris, Albion, Geneseo, Fulton, N. Y.; Bridgeton, N. J.; Ponchatoula, La.; Indianapolis, Marion, Ind.; Omaha, Neb.; Hillsboro, Woodburn, Astoria, Ore.; Fairmont, Winnebago, Waseca, Madelia, Minn.; Lake Ahabasca, Halifax, N. S., Canada; Newfoundland; Riverhead, West Sayville, L. I., N. Y.	Birds Eye Frosted Foods	Fruits, vegetables, fish, shellfish, poultry and meats	Boxes, 2½, 5 lb.; retail consumer and institutional sizes	General Foods, Multi-plate freezers	Size of pack not reported, but output has increased at rate of 40 percent each year		
Frosted Fruit Products. 200 Center St., Los Angeles, Calif.	Los Angeles, Calif.	Chilled-Ripe	Strawberries, peaches, nectarines, apricots, plums, prunes, raspberries, boysenberries, loganberries, blackberries, pineapples, persimmons, tangerines	Fiberboard containers with laminated cellophane liner, 30 lb.	Air blast, 30 deg. below zero	1,250,000	1,626,000	2,750,000
Frozen Products Corp. 1502 Hamilton Bank Bldg., Knoxville, Tenn.	Knoxville, Tenn.	Winter-Garden	Strawberries, blackberries, peaches, apples, blueberries, corn, green beans. Poultry. Eggs	10 oz. to 1 lb.; 2, 2½, 4, 5, 30 lb.	Finnegan, zero to 20 deg. below zero	.....	1,100,000	3,000,000
Fruit Belt Preserving Co. East Williamson, N. Y.	East Williamson, N. Y.	Sea King	Cherries, peas	Tins, 10, 15, 30 lb.	Sharp freezer	350,340	471,080	175,870
Fruit Growers Co-operative. Sturgeon Bay, Wis.	.....	.....	RSP cherries	Barrels, ⅛ barrels; kegs; tins, 30 and 50 lb.	Sharp freezer	6,500,000	.....	.....
General Seafoods Corp. 1–15 Fish Pier, Boston, Mass.	Boston, Mass.	Birds Eye	Fish of all varieties	.....	Birds Eye	(Output distributed by Frosted Foods Sales Corp.)		
Genoa Fisheries. 250 Northern Ave., Boston, Mass.	Public Cold Storage, Boston, Mass.	Genoa	Fillets (skin and skinless): Haddock, cod, hake, pollock, cusk, flounder, lemonsole, graysole, red perch, catfish, whiting. Round fish: Sardines, whiting, white bone squid, sand eels, skates wings, monkey fish, porgies, tuna fish, eels, smelts, mackerel, butterfish, white bait, shrimp, Spanish mackerel	Wood boxes (5, 10, 15 lb.) fillets wrapped in parchment paper and transparent cellulose	Sharp freezer; air blast	.....	4,300,000	5,400,000
Gorton Pew Fisheries Co. Gloucester, Mass.	Gloucester, Mass.; Caraquet, N. B., Canada	Gorton's	Haddock, cod, rosefish, sole, scallops, clams, hake, mackerel, whiting, herring, flounder, pork and beans	5, 10, 15 lb. cellophane and parchment wrappers. Cartons and wooden boxes	Sharp freezer	13,666,400	16,548,600	18,000,000
Growers & Packers Cooperative Canning Co. North Collins, N. Y.	North Collins, N. Y.	Gro-Pak	Strawberries, raspberries, currants, grapes, green and wax beans	Barrels; cartons; cans	.....	600,000	450,000	350,000
Gulf Food Products Co. 525 St. Louis St., New Orleans, La.	New Orleans, La.	Three Stars, Sun	Shrimp, fish	5-lb. packages	Air blast	750,000	1,000,000	1,000,000
Harvey & Co., Ltd. St. John's, Newfoundland	St. John's, Newfoundland; floating plant, "Sunset Glow"	Terra Nova, Old Colony, New Dominion, Cutlass, Birds Eye	Fish, all varieties. Blueberries	Wood cases, 100, 50, 14 lb.; waxed cartons	Our own special method of indirect brine freezing. Birds Eye (General Foods products only)	2,590,000	2,770,000	4,650,000
L. G. Haviland & Son. Highland, N. Y.	Highland, N. Y. Pack for Geo. W. Haxton & Son, Oakfield, N. Y.	.....	Currants, raspberries, grapes	.....	Sharp freezer, zero to 20 deg. below	200,000	2,000,000	1,500,000
Geo. W. Haxton & Son, Inc. Oakfield, N. Y.	Barker, Hudson, East Williamson, N. Y.	Blue Boy	Cherries, strawberries, grapes, grape pulp, quince, crabapple and cherry juice, currants, raspberries, huckleberries, plums, prunes, rhubarb, peaches, elderberries, blueberries	Tins, 30, 50 lb.; barrels	Sharp freezer	8,088,175	13,651,525	10,500,000

FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Heeney Frosted Foods, Ltd. 78 Bank St., Ottawa, Canada	Toronto, Canada	Zeropack	Strawberries, raspberries, cherries, blueberries, peaches, peas, asparagus, spinach, beans (green and wax), lima beans, corn on cob, brussels sprouts, broccoli, cauliflower, rhubarb, squash, haddock, cod, halibut, scallops, oysters, lobster, swordfish, salmon, lamb chops, beef, other meats	Containers, 12, 16, 40, 80 oz.; 1, 4, 10, 24 lb.	Direct contact, sharp freezer, 12 to 20 deg. below zero	700,000	800,000	.....
Hershey Packing Co. Snohomish, Wash.	Snohomish, Wash.	Hershey, Pioneer, Arctic	Strawberries, blackberries, raspberries, peas, beans, broccoli	30-lb. Bulkans, barrels for berries, 5-lb. cartons, water finish, sulphite, waxed paper overwrap (no cellophane liner for vegetables)	.....	250,000	250,000	1,200,000
Hewlett Bros. Co. Salt Lake City, Utah	Salt Lake City, Utah	Hewlett's	Strawberries, raspberries, cherries, grapes, plums, currants	Barrels, 50 gal.	Ammonia, zero to 15 deg. above	450,000	400,000	350,000
Holley Canning Co., Inc. 1 Hudson St., Holley, N. Y.	.....	Holleyripe	Apples, cherries	Tins and corrugated cartons with cellophane linings, 30, 50 lb.	Air blast, Finnegan	.....	600,000	1,000,000
Honor Brand Frosted Foods Corp. 5601 E. 14th St., Oakland, Calif. (Subsidiary of Stokely Bros. & Co., Indianapolis, Ind.)	Kent, Zillah, Wash.; Santa Cruz, Modesto, Calif.; Dover, Del.	Honor Brand, World Wide, Galcon Brand	Asparagus, string beans, wax beans, lima beans, cut corn, corn on cob, broccoli, brussels sprouts, spinach, cauliflower, peas, strawberries, raspberries, peaches, apricots, loganberries, youngberries, blackberries, blueberries, cherries	Cartons (waxed, transparent bag inside, waxed wrapper), 10, 12, 14 and 16 oz.; 2, 2½, 5, 10 lb., also 30- and 50-lb. containers	Air-blast tunnels, minus 15 to minus 40 deg.	.....	12,320,300	27,000,000
House of David Cold Storage 12th & Market Sts., Benton Harbor, Mich.	Benton Harbor, Mich.	House of David, and private brands	Fruits: Strawberries, cherries, red raspberries, black raspberries, dewberries, blackberries, gooseberries, boysenberries, grapes, peaches. Vegetables: Cauliflower, spinach, mustard greens, corn on cob, string beans	Tins, 30, 50 lb.; barrels, 350, 400 lb.	Sharp freezer, 20 deg. below zero	5,473,182	6,487,747	....
Hudson-Duncan & Co. 325 S. E. Water Ave., Portland 14, Ore.	Portland, Ore. (use North West Ice & Cold Storage Co. for freezing)	Pride of Oregon	Strawberries, raspberries, youngberries, boysenberries, loganberries, blackcaps, prunes, apricots	Barrels, 50 gal.; cartons with cellophane liner, 30 lb.	Sharp freezer	4,200,000	.....	6,392,000
Hudson River Fruit Exchange, Inc. Milton, N. Y.	Milton, N. Y.	.....	Red currants, cherries, plums, grapes, crabapples, quinces, apple pulp	Barrels, 50 gal.	Zero to 10 deg. below	3,500,000	6,700,000	4,500,000
Hunt Brothers Packing Co. Salem, Ore.	Puyallup, Wash.; Salem, Ore.	No brands	Berries, prunes	Barrels only	Regular cold pack barrel freezing	675,000 (Berries)	360,000 (Berries)	280,000 (Berries)
Kelley, Farquhar & Co. Port of Tacoma, Tacoma, Wash.	Tacoma, Wash.; Salem, Ore.	Frost Queen, Sparklets	Strawberries, red and black raspberries, loganberries, gooseberries, blackberries, youngberries, peaches, apricots, prunes, peas, corn, beans, spinach, asparagus, broccoli, cauliflower, sour cherries	From 10-oz. cartons to 50-gal. barrels (smaller rectangular paper cartons have outer double wrap)	Air blast (for freezing before packing and for package freezing)	.....	.....	.....
Kold Kist, Inc. 5329 E. Washington St., Los Angeles, Calif.	Los Angeles, Calif.	Kold Kist	Frozen cooked foods	Cartons, waxed, 1 lb., 1 and 2 qt.	Sharp and quick freezing	.....	.....	.....
Kruse's, Inc. 2253 Germantown Ave., Philadelphia, Pa.	Philadelphia, Pa.; Plant City, Fla.; Nashville, Tenn. (Public warehouses)	.....	Strawberries, peaches, raspberries	Barrels and kegs	Zero to 30 deg. below	6,000,000	.....	.....
F. G. Lamb & Co. P. O. Box 88, Freewater, Ore.	Freewater, Ore.	.....	Cherries, prunes, apples, peas, asparagus, lima beans, spinach, grapes, eggs, meats	Corrugated boxes with cellophane or waxed bags, 30 lb.	Sharp freezer (air blast)	250,000	1,720,000	11,300,000
Lawtons Canning Co., Inc. Seneca St., Lawtons, N. Y.	Buffalo, N. Y.	Lawtons	Strawberries, raspberries, currants	Barrels	Sharp freezer	304,720	400,000	150,000
Little America Finer Frosted Foods Co. 18th & Smallman Sts., Pittsburgh, 22, Pa. (Does no freezing in own plants)	.....	Little America	All food items except meat	10 oz. to a barrel	Air blast	17,850,000	.....	17,850,000
W. G. Loggie Co. Ltd. Chatham, N. B., Canada	Chatham, Shippegan, Clukeemao, N. B.	None	Blueberries, fish	30-lb. wood cases with parchment liner	Ice and salt; ammonia	850,000	850,000	850,000
Long Island Duck Packing Corp. Eastport, N. Y.	Eastport, Riverhead, L. I.	Various brands	Ducks, poultry, oysters	Wood boxes, paper cartons	Birds Eye, own	4,500,000	6,000,000	10,000,000
B. E. Maling, Inc. Hillsboro, Ore.	Hillsboro	Birds Eye	Asparagus, spinach, rhubarb, strawberries, peas, peas and carrots, red raspberries, youngberries, wax beans, green beans, lima beans, peaches, cauliflower, broccoli, brussels sprouts, squash, turkeys, RSP cherries, mixed fruit, mixed vegetables	Transparent-cellulose lined wax paper cartons, 1, 2, 2½, 5, 10 lb.	Birds Eye	(Output distributed by Frosted Foods Sales Corp.)		
Maplecrest Turkey Farms Wellman, Iowa	Wellman, Iowa	Maplecrest	Dressed turkeys	Individual, for retail use only	Sharp freezer	200,000	250,000	400,000
Marion Canning Co., Inc. Marion, N. Y.	Marion, N. Y.	Harvest Moon	Cherries, raspberries, rhubarb, apples	Tins: fiber cartons, 10, 15, 30 lb.	Sharp freezer, zero and below	297,780	552,450	800,000
Geo. F. Martin & Co. P. O. Drawer 511, Watsonville, Calif.	Watsonville, Calif.	None	Apples, apricots, youngberries, boysenberries, loganberries, blackberries	Fibreboard cartons with moisture vaporproof liners, 25, 30 lb.	Air blast, zero to 35 deg. below	68 000	280,000	500,000

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THE MENASHA PRODUCTS CO.
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FROZEN FOOD PACKAGES

FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Mavar Shrimp & Oyster Co., Ltd. East Beach & Maple St., Biloxi, Miss.	Biloxi, Ocean Springs, Bay St. Louis, Miss.	Silvercrest	Shrimp, headless and peeled	Waxed cardboard, 5 lb	Sharp freezer	300,000	100,000	300,000
L. C. Mays Co., Inc. 423 Gravier St., New Orleans, La.	Hammond, Independence, Ponchatoula, La.	Mayco	Strawberries	Tins, cartons, 30 lb.; barrels, 450 lb.	Cold storage, zero or below	754,704	1,096,316	878,107
William E. McIntosh Avenue E, Geneva, N. Y.	Geneva, N. Y.	Green Top	Rhubarb, raspberries, strawberries, cherries, peaches, apples	30-lb. tins and cartons, barrels	Sharp freezer	2,500,000	3,000,000	3,500,000
Missouri State Chickeries (Operating Botz Chickeries) P. O. Box 510, Jefferson City, Mo.	Jefferson City, Mo	Botz Poussinette, Botz Poulette	Battery raised broilers	Corrugated cartons, bulk packed (24 x 12 x 10½ in.)	Botz quick freezer, 40 deg. below zero	225,000	250,000	300,000
S. A. Moffett Co. 1331 Western Ave., Seattle, 1, Wash.	Grandview, Mt. Vernon, Seattle, Wash.	Polar, Samco, Valley	Asparagus, green beans, lima beans, broccoli, brussels sprouts, cauliflower, corn, peas, carrots, spinach, squash, apples, apricots, boysenberries, cherries, currants, huckleberries, prunes, peaches, raspberries, strawberries	Fiber cartons, cellophane lined, 10 oz. to 5 lb. Also barrels, 50 gal.	All types, but use belt freezer principally. Also use package tunnel. Freezers average 20 deg. below zero	13,579,811	17,412,526	21,000,000
Monmouth Beach Cold Storage Co., Inc. Monmouth Beach, N. J.	Monmouth Beach, N. J.	Polar Brand	Fish	Wooden boxes from 100 to 125 lb.	Sharp freezer	1,500,000	1,250,000	2,000,000
Monmouth Canning Co. 256 Commercial St., Portland, Me.	Portland, Me	Monmouth	Blueberries	Fiber cylinders, 24 lb	Sharp freezer, zero deg.	400,000	525,000	650,000
Morton Canning Co. Inc Morton, N. Y.	Morton, N. Y	Morton	RSP cherries	Tins, 15, 30 and 50 lb	Finnegan	532,800		305,815
W. A. Munn & Co., Ltd St. John's, Newfoundland	St. John's, Newfoundland.	Munn's	Blueberries, cod liver oil	Blueberries in 30-lb. boxes; cod liver oil, 30-gal. containers				
C. H. Musselman Co Biglerville, Pa.	Biglerville, Pa	Musselman s	Apples, R.S. cherries, black raspberries	Barrels; tins; cartons cellophane pack, freezer board carton	Air blast	640,000	1,000,000	
National Frosted Foods, Inc. 110 Cliff St., New York, N. Y.	Does not freeze in own plants	National	Cod fillets, ocean perch, swordfish, scallops, haddock fillets, flounder fillets, shrimp, corned beef hash	Carton, cellophane lined, 1 lb.; cardboard, 5 lb.	Sharp freezers and Z process	400,000	750,000	550,000
National Fruit Canning Co. 1720 W. Spokane St., Seattle 6, Wash.	Chehalis, Wash.	Valamont	Strawberries, spinach, peaches, berries, peas, corn, beet greens, Swiss chard, cherries, juneberries, apricots	12 oz., 5 lb., 30-lb. containers. Barrels	Finnegan	5,777,902	5,244,353	4,155,000
New England Fillet Co., Inc. 26 Boston Fish Pier, Boston, Mass.	Boston, Gloucester, Mass.	Seacrest	Seafoods	Containers, 5, 10, 15 lb. Use both wood and cartons	Air blast, 16 deg. below zero	4,000,000	4,500,000	6,500,000
New England Fish Co. Spokane St. Terminal, Seattle 4, Wash.	Seattle, Kalama, Wash.; Astoria, Ore.; Vancouver, Butedale, Prince Rupert, B. C.; Ketchikan, Juneau, Petersburg, Sitka, Alaska	Belleanna, Nefco, Columbia	Halibut, salmon, sable fish, soles, flounders, rock fish, shad, sturgeon, cod	50-, 100-, 200-, 300-lb. waxed cartons; 5- and 10-lb. packed 50 lb. to a corrugated fiber master carton. 10-lb. glazed blocks packed 50 lb. to a wooden box	Birds Eye and low temperature sharp freezer	5,000,000	6,000,000	6,000,000
New York Frozen Foods Corp. 48 High St., Brockport, N. Y.; 312 Washington St., New York, N. Y.	Brockport, N. Y	Nyffco	Cherries, strawberries, plums, peaches, currants, grapes, elderberries, red and black raspberries, prunes, blueberries, blackberries, apples	Cans, 30, 50 lb.; barrels, 50 to 52 gal.	Sharp freezer, 30 deg. below zero. Cold pack	2,000,000	4,000,000	6,000,000
Nickerson Brothers, Ltd. Liverpool, N. S.	Liverpool, N. S.	Mersey, Prime	Fish	10, 15, 20, 50, 100, 200 lb.	Sharp freezer	2,300,000	2,500,000	2,000,000
Herbert A. Nieman & Co. Canneries Division, Thiensville, Wis.	Thiensville, Wis.	Garden Spot, True Blue	Peas, carrots, corn, beets	12 oz.; 2½, 5 lb., 25 to 35 lb. bulk	Sharp freezer (air blast)	2,060,000	2,643,895	1,500,000
Norfolk Berry Growers' Association 170 West St., Simcoe, Ont., Canada	Simcoe, Ont.	Norfolk	Strawberries, raspberries	Barrels, 40 gal.; pails, 30 lb.	Sharp freezer, zero	210,962	23,689	
North Wind Packing Co., Inc. 2200 First Ave., Seattle, Wash.	Sumner, Wash.	North Wind, Negea	Rhubarb, strawberries, raspberries, blackberries, peas, beans, spinach, carrots, beets, huckleberries	Cartons, 5 lb., water-finish sulphite, waxed-paper overwrap, no cellophane liner. 4-lb. cartons for beans; barrels and 30-lb. Bulkans for berries	Air blast, 5 deg. below zero	810,000	1,400,000	2,600,000
Northport Cherry Factory, Inc. Northport, Mich.	Northport, Mich.		Sour cherries	Tins, 30 and 50 lb.; kegs, 125 lb.; barrels	Sharp freezer	631,025	364,000	220,000
Norwegian Canadian Packers, Ltd. Norway, N. B., Canada (via Chamcook)	Norway, N. B.	Wee MacGreegor	All varieties of fish	Wood boxes principally, 15 lb. net	Sharp freezer with air blast			
O'Donnell-Usen Fisheries 197 Northern Ave., Boston, Mass.	Boston, Gloucester, Mass.	O'Donnell Quality, Taste OC, Fish of the Day	Fillets of haddock, cod, ocean perch, whiting, pollock, flounder, sole and mackerel; scallops and H & G whiting	5, 10 and 15-lb. cartons	Air blast	7,000,000	8,000,000	9,000,000
Okeena Canning Co. Dyersburg, Tenn.	Dyersburg, Tenn.	Okeena and Craddock	Strawberries, blackberries, boysenberries, dewberries, youngberries, grapes, peaches. Vegetables	Containers, 20 and 30 lb.; barrels	Sharp freezer (products also frozen individually)		2,000,000	7,000,000
Olney & Carpenter, Inc. Wolcott, N. Y.	Wolcott, Eden, N. Y.	O & C, Frost Seald	Asparagus, spinach, strawberries, rhubarb, peas, raspberries, string beans, lima beans, cherries, broccoli, cauliflower, brussels sprouts, squash, peaches, whole kernel corn, corn on cob, peas and carrots	12-oz. and 2½-lb. packages	Air blast	4,378,016		

Pleasant Grove Canning Co. Pleasant Grove, Utah	Utah Ice & Storage Co., Provo, Utah	None	Strawberries, raspberries, apricots, peaches, peas, corn, lima beans	Cartons, 50 lb.; cans, 30 lb.; barrels, 50 gal.	Air blast, 40 deg. below zero	500,000	1,000,000	1,000,000
Pony Brand Essence & Sirup Co., Ltd. Quebec City, Que., Canada	Quebec City	Pony Brand	Strawberries, raspberries, blueberries	2-lb. cups, 30-lb. pails; 400-lb. barrels	Sharp freezer	200,000	250,000	300,000
			All varieties of vegetables and fruits, fish	Tins, waxboard cartons, 10	Various systems			

Pleasant Grove Canning Co., Pleasant Grove, Utah	Utah Ice & Storage Co., Provo, Utah	None	Strawberries, raspberries, apricots, peaches, peas, corn, lima beans	Cartons, 50 lb.; cans, 30 lb.; barrels, 50 gal.	Air blast, 40 deg. below zero	500,000	1,000,000	1,000,000
Pony Braid Essence & Syrup Co., Ltd., Quebec City, Que., Canada	Pony Brand		Strawberries, raspberries, blueberries	2-lb. cups, 30-lb. pails; 400-lb. barrels	Sharp freezer	200,000	250,000	300,000
Pratt's Fresh Frozen Foods, Inc., 513 W. 16th St., New York, N. Y.	Pratts'		All varieties of vegetables and fruits, fish, meat, poultry	Tins, waxboard cartons, 10 oz.–30 lb.	Various systems used in different plants. All products are quick frozen			
R. D. Pringle & Co., Ogden, Utah	Ogden, Utah	Parch Pak't	Apricots, cherries, peaches, prunes, figs	35-lb. cartons	Sharp freezer			
Producers Co-op. Packing Co., Salem, Ore.	Use custom refrigerating, Salem, Ore.	Flavorpac	Strawberries, gooseberries, loganberries, red raspberries, black raspberries, boysenberries, youngberries, RS cherries, prunes	30-lb. packages; barrels	Sharp freezer	154,380	431,994	1,370,993
Producers Service Corp., Benton Harbor, Mich.	Public warehouses — Chicago; Indianapolis; Detroit, Sodus, Mich.		Strawberries, raspberries, dewberries, plums, peaches, apples, grapes, cherries	50-gal. barrels, 30- and 50-lb. packages	Public warehouses	633,200	1,500,000	3,000,000
Pure Fruit Juices, Inc., Los Angeles, Calif.	Los Angeles, Calif.	Cold Gold	Oranges, lemon juice	Enamel-lined cans, 120 oz.; glass jars, 30 oz.	Finnegan rotary freezer, zero to 20 deg. below zero	120,000	822,000	600,000
Red-E-Foods, Inc., Rochester, N. Y.	Rochester, N. Y.	Old Newfield	Frozen cooked specialties	Round wax 8-oz. containers; institutional size packages	Sharp freezer, 10 deg. below zero	None	120,000	360,000
The Reidpath Co., Richibucto, N. B., Canada	Richibucto, N. B.	Reidpath's Frozen Food Products	Strawberries, blueberries, cranberries. Sea herring, mackerel, cod, shad, eels, tomcods, smelts, flounders	Boxes, 10, 15, 30, 50, 100 lb. Smelts, transparent wrappers, 2 lb. Sealright containers for berries in quart, pint and ½-pt. sizes	Sharp freezer, 20 deg. below zero	720,000	758,000	850,000
Richardson & Holland, Inc., 1001 John St., Seattle 9, Wash.	Public storage in Seattle	R & H Brand	Strawberries	Wood barrels, 30-lb. tins	Sharp freezer	675,981	349,470	89,400
Rocky Mountain Packing Corp., P. O. Box 1618, Salt Lake City 11, Utah	Ogden, Utah	Twin Peaks, Snoline, Glenwood, Naturipe, Majestic, Ogden Valley	Peas, green beans, lima beans	Wet waxed tuck end cartons inner lined with cellophane bags, 12 oz., 2½ and 5 lb. bulk containers	Tray freezer, 30 deg. below zero	980,756	962,840	1,137,916
Rood & McLean Fruit Products, Westfield, N. Y.	Erie, Pa. (public storage)		Cherries, strawberries, raspberries, currants	Cold pack in barrels and 30-lb. tins	Sharp freezer	950,000	250,000	200,000
Royal Canning Corp., 175 31st St., Ogden, Utah	Ogden, Utah	Royal	RS cherries, apricots, peaches, prunes, apples, raspberries	Tin and paper, 30, 50 lb. barrels, 250, 400 lb.	Sharp freezer			
Santa Clara Frosted Foods Co., P. O. Box 222, Santa Clara, Calif.	Santa Clara, Calif.	Year Round	Broccoli, brussels sprouts, asparagus, apricots, peaches, lima beans, peas	Containers: 12 oz.; 2½, 5 and 30 lb.	Air blast	600,000	1,312,000	2,000,000
Richibucto, N. B., Canada				brussels sprouts, squash, peaches, whole kernel corn, corn on cob, peas and carrots				

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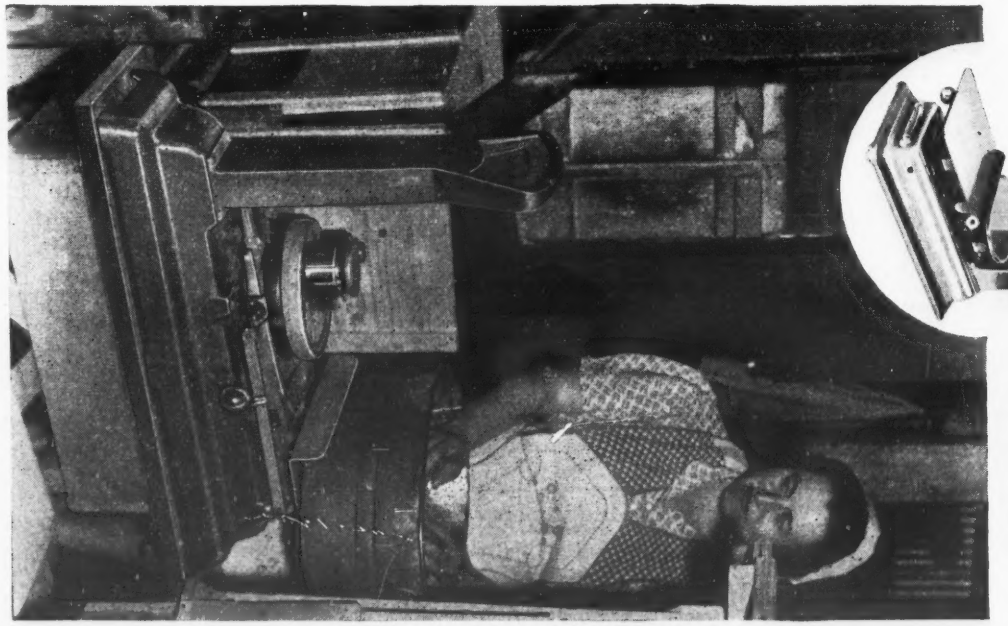
FROZEN FOODS DIRECTORY

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.) (estimated)
Sebastian Stuart Fish Co. Seattle, Wash.	Seattle, Wash.; Tyee, Alaska	S & S, Taste-T	Halibut, salmon, cod. All varieties of Pacific Coast fish, whole and fillets	Containers, 5 lb.; blocks, 10 lb.	Sharp freezer	3,000,000	.....	.....
John Sexton & Co. Chicago, Ill.	Chicago, Ill.; Atlanta, Ga.; Dallas, Tex.; Brooklyn, N. Y.	Edelweiss	Apricots, blueberries, blackberries, loganberries, plums, apples, raspberries, strawberries. All vegetables	Containers, 2½, 10, 30 lb.	Zero to 5 deg. below zero	.....	.....	.....
Sky Bros. Altoona, Pa. (Distributes under own label but does not pack)	Our private label is packed by General Seafoods, Boston, Mass.; John Dulany & Co., Fruitland, Md.; Swift & Co., Chicago, Ill.; and others	Skibo	Complete line of sea foods, fruits, vegetables, meats, poultry	Cartons, 10, 12, 16 oz.; 2½, 5 lb.; boxes, 10, 15, 30 lb.	Quick freezing	1,828,500	2,000,000	2,750,000
E. A. Smith & Co. 2323 Orleans St., Baltimore, Md.	Baltimore, Md.	.....	Strawberries, black and red raspberries, blackberries, peaches and apples	Cans, 10, 15, 30 lb.; barrels	Sharp freezer	1,000,000	1,000,000	2,000,000
Snider Packing Corp. 40 Franklin St., Rochester, N. Y.	Marion, Ind.; Medina, Albion, Mt. Morris, Fulton, N. Y.; Houlton, Me.	Birds Eye, Snider	Peas, corn, green beans, wax beans, spinach, asparagus, broccoli, lima beans, strawberries, peaches, blueberries, cherries	Cartons with transparent cellulose liner	Multiplate Birds Eye frosters	(Pack distributed by Frosted Foods Sales Corp.)		
Sodus Canning Co. Sodus, N. Y.	.....	.....	Cherries, raspberries	Tins, 30, 50 lb.; barrels	Air blast	208,000	328,000	90,000
Sodus Fruit Farm, Inc. Box 73, Sodus, N. Y.	Sodus, N. Y.	Sodus Fruit Farm	RSP cherries	Cans, 30, 50 lb.; barrels, 50 lb.	Sharp freezer	1,362,424	.....	.....
Southern Packing Co., Inc. Foot of Fell St., Baltimore, Md.	Baltimore, Md.	Sodalicious	Strawberries, peaches, raspberries, cherries, pineapple, apples	Cans, 30, 55 lb.; barrels, half barrels	Cold storage, 20 deg. below zero	2,000,000	2,000,000	1,250,000
Spencer Packing Co., Inc. 688 Third St., Lebanon, Ore.	Albany, Ore.	Spencer	Boysenberries, gooseberries, loganberries, black raspberries, red raspberries, strawberries, youngberries, prunes	50-gal. wooden barrels; 30-lb. cellophane bags; packed in fiber boxes holding 1 bag each	Air blast	1,115,634	758,750	1,500,000
Springbrook Packing Co. Co-op. Springbrook, Ore.	Springbrook, Ore.	Springbrook	Strawberries, rhubarb, gooseberries, red sour cherries, black raspberries, red raspberries, boysenberries, prunes, plums	50-gal. wooden barrels; 30-lb. cartons	Air blast	407,540	329,110	1,279,900
Standard Brands, Inc. 595 Madison Ave., New York 22, N. Y.	.....	.....	Blueberries. (Distributors of other fruits and vegetables packed under own label)	.....	Air blast	1,000,000	.....	.....
Standard Foods, Inc. Louisville, Ky.	Louisville, Ky.	Kentuk, Standards, Redyquik; Private Labels	Meat only	Fiber containers, cellophane lined, 4 lb.	Air blast, 20 deg. below zero	650,000	750,000	600,000
Starr Fruit Products Co. 105 S. E. Yamhill St., Portland 14, Ore.	Salem, Ore.	Buyer's	All berries, peaches, apricots, cherries, plums, spinach, asparagus, cauliflower, brussels sprouts, carrots, beans, broccoli	Regular cartons with Menasha bags, 1, 2½, 12½, 30 lb.	.....	.....	.....	4,000,000
Stayton Canning Co. Co-op. Stayton, Ore.	Salem, Ore. (Public plant)	Santian	Berries, prunes	50-gal. barrels	Cold pack	1,040,000	2,040,000	3,600,000
A. L. Stewart & Sons Cherryfield 2, Me.	Portland, Me.	Stewart's	Blueberries	Boxes, 24, 30 lb.	Sharp freezer	100,000	50,000	75,000
Suffolk Farms Revere, Mass.	Revere, Mass.	Suffolk Farms	Spinach, rhubarb, broccoli, string beans, cauliflower	Containers, 14 oz., 2½, 5, 25 lb.	Air blast, 25 deg. below zero	500,000	.....	1,700,000
Sunshine Packing Corp. of Pa. North East, Pa.	North East, Pa. (cold storage). Seasonal at Cleveland, Ohio; Greencastle, Pa.; Clintondale, N. Y.	Sunshine	Strawberries, cherries, red and black raspberries, blackberries, currants (red and black), crushed pineapple, peaches, apricots, elderberries, gooseberries, blueberries, Columbian raspberries, grapes, prunes, plums, fruit juices, pulps and purees of all kinds	Cans, 5, 10, 15, 30 lb.; barrels, 450 lb.; cartons of all sizes	Sharp freezer	18,000,000 to 20,000,000 yearly		
Tennessee Fresh Frozen Foods, Inc. Portland, Tenn.	Packing plants in Portland, Tenn., and Franklin, Ky. Freezing done at Noel Cold Storage, Nashville, Tenn.	10-A-C	Strawberries, blackberries, raspberries, elderberries, huckleberries (wild)	Cylindrical wooden drums are used for quick frozen straight, 30 lb. Cylindrical wooden drums, with cellophane bags for sugar pack, 30 lb.	Air blast, to 20 deg. below zero	1,000,000	600,000	1,600,000
Todkill & Chapman	Buffalo, N. Y.; Cleveland, Ohio; Columbus, Ohio; Erie, Pa.	T & C	Strawberries, raspberries, currants, cherries, gooseberries, grapes, prunes	Paper cups, 1 lb. Fiber and cellophane packages, 30 lb. Tins, lacquered, 30 lb. Barrels	Sharp freezer, 15 deg. below zero	2,485,252	2,012,686	2,100,000
Union Fisheries, Inc. Biloxi, Miss.	Biloxi, Miss.	Gulf Fresh, Union De Luxe	Shrimp	Cartons, 5 lb.	Quick freeze	2,000,000	1,500,000	1,500,000
Vashon Island Packing Co. Vashon, Wash.	Vashon, Wash.	Island	Strawberries, loganberries, boysenberries, raspberries, gooseberries, red currants	Barrels, 52 gal.	Sharp freezer	1,750,000	.....	.....
Ward & LeRoy, Inc. Belden Ave., Sodus, N. Y.	Sodus, N. Y.	None	Sour cherries	30-lb. tin	Sharp freezer	570,000	1,200,000	600,000
Washington Canners Co-op. 507½ Main St., Vancouver, Wash.	Vancouver, Wash.	Bestwest, Flavorpac, Norpac	Strawberries, red raspberries, red sour cherries, black cherries, boysenberries, loganberries, youngberries, blackberries, blueberries, prunes	Tins (5, 10, 15, 30, 50 lb.); barrels (50 gal.); cups (1 lb.); packages (1, 2½ lb.); boxes, (30 lb.); cans (No. 10, 12)	Air blast, 10 deg. below zero to zero	3,000,000	2,000,000	3,000,000
Washington Farmers' Products Control Board, Inc. Puyallup, Wash.	.....	.....	Blackberries, red raspberries	Barrels	.....	.....	.....	675,000

			loganberries, youngberries, blackberries, blueberries, prunes	lb.); packages (1, 2½ lb.); boxes, (30 lb.); cans (No. 10, 12)	zero			

Washington Farmers' Products Control Board, Inc. Puyallup, Wash.	.....	.....	Blackberries, red raspberries.....	Barrels.....	.....	.....	.....	675,000
Washington Packers, Inc. Sumner, Wash.	Sumner, Puyallup, Wash.	Dewkist, Kol-Pak.	Fruit: Currants, rhubarb, gooseberries, strawberries, loganberries, raspberries, blackberries, cherries, prunes, youngberries, boysenberries, blueberries, huckleberries, peaches, pumpkin. Vegetables: Corn, beans, peas, peas and carrots, spinach, asparagus, broccoli	Packages, 10, 12, 14, 16 oz.; cartons, 2, 2½, 5, 10, 30 lb.; tins, 5, 10, 15, 30 lb.; "suitcases," 10, 25 lb.	Sharp freezer.....	6,000,000	7,500,000	10,000,000
Waterman & Sons, Inc. Ontario Center, N. Y.	Ontario and Webster, N. Y.	Lake Shore.....	Cherries.....	Cans, 30, 50 lb.; barrels....	Sharp freezer.....	500,000	.....	.....
Wentzell Bros. East Beach Blvd., Biloxi, Miss.	Biloxi, Miss.....	W. B.....	Shrimp, shrimp meat, crabmeat.....	Fiberboard cartons, waxed, 5 lb.	Sharp freezer.....	100,000	175,000	175,000
Whiz Fish Products Co. 1525 Alaskan Way, Seattle 1, Wash.	Seattle, Wash.....	Whiz.....	Halibut, salmon, fillet of sole, sablefish, ling cod	No packaged items at present	Sharp freezer, 25 deg. below zero	3,000,000	1,200,000	1,000,000
B. Wilson Co., Ltd. 536 Herald St., Victoria, B. C.	Victoria, B. C.....	Wilson's.....	Green peas, green beans, corn (kernels and on cob), asparagus, strawberries, raspberries, loganberries, cherries, gooseberries, youngberries, boysenberries	Containers, waxed board, 12 oz., 2½, 5 lb.; cups, 15 oz.; tins, 12, 25 lb.; cartons, dry pack, 20 lb.	Air blast, tunnel, 15 deg. below zero. Products frozen loose	100,000	144,000	178,000
Witt's Med-O-Sweet Farm..... Osseo, Minn.	Osseo, Minn.....	Med-O-Sweet.....	Strawberries, raspberries, blueberries, asparagus, green beans. Poultry	Fruits and vegetables, 12 & 18-lb. paper cartons. Poultry in wood boxes	Sharp freezer, (air blast)	50,000	60,000	88,000
D. H. Wright & Co. Webster, N. Y.	Webster and Wilson, N. Y.	None.....	RSP cherries, strawberries, black and red raspberries, peaches	Tins, 30, 50 lb.; barrels, 50 gal.; smaller packages when ordered	Sharp freezer.....	450,000	.....	.....
Wyoming County Products, Inc. Wyoming, N. Y.	Middleport and Buffalo, N. Y.	Wyoming Maid...	Berries, cherries, grape products, fruit juices	Barrels.....	Sharp freezer.....	2,000,000	1,500,000	750,000
Yakima Valley Frosted Foods Grandview, Wash.	Grandview, Wash.....	(Custom freeze for others only)	Vegetables: Asparagus, peas, lima beans, spinach, sweet corn. Fruits: Apples, grapes, peaches, apricots, cherries, prunes. Hops. Turkeys	Packages, paper and cellophane, 12 oz., 2½ and 5 lb.; 1-lb. paper and cellophane cups; Bulkans, 30 lb.; tins, 30, 50 lb.	Air blast sharp freezer, 0 to 20 deg. below zero	.....	3,020,000	5,300,000
The Zeropack Co. Second and Race Sts., Cincinnati, Ohio	Winchester, Va.....	Zeropak.....	Apples, peaches, cherries and other berry fruits	Containers, 30 and 50 lb...	Sharp freezer.....	.....	.....	.....

This Picture Tells the Story...



Woman employee using an EXACT WEIGHT Scale for dehydrated cabbage preparatory to filling 5 gallon cans—Campbell Products Company, San Jose, California

An experienced buyer may estimate a truck load of head cabbage or weigh it in tons and still be safe but packaging the finished dehydrated product is another matter. Weighing now becomes a pounds and ounces operation for dehydration produces a concentrated product of high value. Packaging such a commodity requires precision scales . . . EXACT WEIGHT Scales with fraction-ounce accuracy. Such accuracy assures profits . . . pays dividends. Processors of dehydrated fruits and vegetables should have the facts . . . the details. Write for them.

Exact Weight Scales

THE EXACT WEIGHT SCALE COMPANY
21 W. Fifth Ave., Columbus 8, Ohio
Dept. T, Toronto, Canada

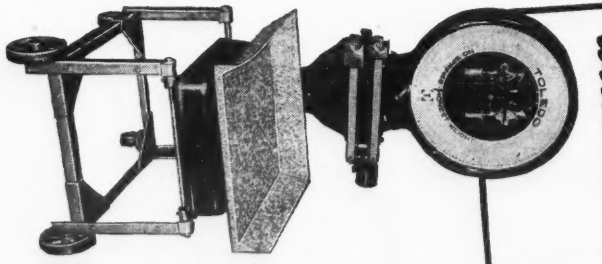
FROZEN FOODS DIRECTORY SUPPLEMENT

Information in this supplement is repeated from the 1942 edition of the Frozen Foods Directory, no further data on the companies listed being reported.

Company	Freezing plant location	Brand	Products	Container	System	1940 output (lb.)	1941 output (lb.)	Intended 1942 output (lb.)
Beutel Canning Co. Bay City, Mich.	Bay City	Michigan	Lima beans, peas, spinach, green beans, wax beans	Transparent bags, cartons		1,000,000	1,500,000	2,800,000
Borden's Dairy Delivery Co. Fresno, Calif.	Fresno, Calif. (Company processes for own use)	Own brand	Purees of peaches, nectarines, plums, oranges, apricots, strawberries, boysenberries	Tins, 30 lb.	Air blast, 10 to 15 deg. below zero		200,000	300,000
Boston Fish Co. 18 Fish Pier, Boston, Mass.	Boston	Monogram	Fillets: haddock, cod, pollock, hake, mackerel, scallops	Wooden boxes, 15, 100, 150 lb.	Air blast	75,000	100,000	100,000
N. W. Brewer Barreling Plant R. F. D. No. 1, Rochester, Wash.	Tacoma Ice Co., Tacoma, Wash.	N. W. Brewer	Strawberries, blackberries	Barrels, 50 gal		425,000	400,000	400,000
J. D. Brown Huntington, B. C.	Bellingham, Wash., New Westminster, B. C.		Red raspberries	285 lb. in paraffine-lined fir casks	Sharp freezing		123,638	150,000
Brown Packing Co. Christian & Howard Sts., Philadelphia, Pa.	Phila. elphia, Pa.; Plant City, Fla.	Brown's Select	Apples (sliced), blackberries, RSP cherries, peaches (yellow and white), pineapple, plums, pumpkin, raspberries (black and red), strawberries, pineapple-coconut, tangerines, pineapple-tangerine, cranberry puree, plum puree, grape puree, strawberry puree, apricot puree, black and red raspberry puree, bananas, huckleberries, blueberries. Also carry a complete line of frozen vegetables	Cartons, waxed, with vegetable parchment liner, 5, 10 lb.; cans, enamel lined, 10, 15, 30, 35, 38, 40, 50, 55, 60 lb.; kegs, 10, 15 gal.; barrels, 40, 50 gal. Vegetables in 2½, 5-lb. containers	Air blast at subzero temperature for small packages; sharp freezer for bulk containers	6,000,000	6,500,000	7,500,000
Canadian Frosted Foods, Ltd. Whitby, Ont., Canada	Toronto	Del Glacio, Sun Ripe	Peas and cherries	Peas, 1½-lb. Sealright waxed cardboard; 5-lb. tins. Cherries, 22- and 12-lb. pails	Sharp freezer			
Canal Fish Co. Sandwich, Mass.	Sandwich	None	Fish	Wooden boxes, 60, 120 lb	Sharp freezer, minus 5 deg.	1,000,000	900,000	800,000
Cherry Growers, Inc. 709–715 E. Front St., Traverse City, Mich.	Traverse City	Montmorency, Reddi-Maid	Cherries, raspberries, peaches, apples	Tins, 30 lb.	Air blast	6,356,185	4,205,947	10,060,000
Coastates Products, Inc. 231 Clay St., San Francisco, Calif.			Quick frozen enchiladas					
Colter Corp. Palacios, Tex.	Palacios		Shrimp, turkeys	Turkeys vacuum-packed in latex				
B. Frank Craddock Co. Dyersburg, Humboldt, Tenn.	Dyersburg, Humboldt	Craddock, Okeena Club	Blakemore and Klondyke strawberries. Occasionally, youngberries, dewberries, spinach, green beans	Cans, 30 lb. Barrels	Air blast, 20 deg. below zero. Also sugar brine quick freeze at 10 deg.	800,000	600,000	600,000
DeJean Packing Co. Biloxi, Miss.	Biloxi, Miss	My-T-Good	Headless shrimp	5-lb. waxed paper cartons	Air blast	200,000	300,000	400,000
Eau Claire Packing Co. Eau Claire, Mich	Eau Claire, Mich	Eau Claire	Black raspberries, cherries	Tins, 30 lb.; Barrels, 400 lb.	Sharp freezer			400,000
Fairmont Creamery Co. 12th & Jones, Omaha, Neb.	Omaha, Neb.; Buffalo, N. Y.; New Haven, Conn.	Fairmont	Peaches, red raspberries, black raspberries, rhubarb, apples. Poultry (eviscerated)	Tins, 10, 15, 30 lb.; cartons; boxes	Finnegan	2,250,000 (Mostly poultry)	2,820,000 (Mostly poultry)	3,450,000 (Mostly poultry)
Marion T. Fannaly, Inc. Ponchatoula, La.	Ponchatoula	Fannaly's	Strawberries, blackberries, figs, shrimp, soft shell crabs, frogs' legs	Cartons, cans, barrels	Sharp freezer. Air blast, Birds Eye "Z"	3,000,000	5,000,000	7,500,000
Farmers' Commission House, Inc. 403 W. 14th St., New York, N. Y.	Eastport, Riverhead, N. Y.	FCH	Long Island ducklings	Ducks individually wrapped in transparent cellulose or Cry-O-Vac				
Farmers Cooperative Union, Inc. Puyallup, Wash.	Tacoma, Wash.	Farmers Cooperative Union, Inc.	All kinds of berries, sour cherries	Barrels, 50 gal.; paraffined tins and cartons, 30 lb.		2,656,935	2,395,683	4,800,000
A. N. Faulkner & Co. Tilghman, Md.	Baltimore, Md.		Strawberries (cold pack)	Tins, 30 lb.		None	None	May pack if supplies are available
Fresno Berry Growers Assn. 4101 Floradora St., Fresno, Calif.	Fresno		Youngberries and boysenberries	Cartons, 30 lb.	Air blast, at minus 20 deg. F.	100,000	300,000	500,000
Frostcraft Packing Corp. 185 Lombard St., San Francisco, Calif.	San Francisco	Frostcraft	Asparagus, spinach, snap beans, lima beans, broccoli, brussels sprouts, cauliflower, strawberries, boysenberries, loganberries, crushed nectarines, black mission figs	Tins, 12 oz., 2½, 5, 30 lb. Two piece Simplex waxed containers, lined with transparent cellulose	Sharp freezer with air blast, 30 deg. below zero	652,000	1,533,000	2,420,000
Frozen Fruits & Juices, Inc. Gasport, N. Y.	Middleport, Buffalo, N. Y.		Strawberries, raspberries, cherries, grape pulp, grape juice	Tins, 30, 50 lb. Barrels	Sharp freezer	Not operating		2,000,000
Gresham Berry Growers Gresham, Ore.	Gresham	Gresham, Norpac, Multnomah, Flav-R-Pac, Wauna, WestPac	Strawberries, raspberries, blackberries, blackcaps, loganberries, youngberries, peaches, boysenberries	Barrels, 50 gal.; cartons, 1, 2½, 10 lb.; cans, 10, 15, 30, 50 lb.				
Gresham Packing Co. Box 344, Gresham, Ore.	Gresham	Gresham Valley Brand	Strawberries, raspberries, boysenberries, youngberries, black raspberries, blackberries, loganberries	Mostly wooden barrels with paraffin lining	Sharp freezer	2,100,000	2,600,000	2,400,000
John T. Handy Co., Inc. Crisfield, Md.	Crisfield		Strawberries and fish	Strawberries in 30-lb. cans	Air blast	550,000 (plus 10,000 doz. soft crabs)	550,000 (plus 10,000 doz. soft crabs)	Same as 1941

Box 344, Gresham, Ore.	Gresham	Gresham Brand	Valley	Strawberries, raspberries, boysenberries, youngberries, black raspberries, blackberries, loganberries	Mostly wooden barrels with paraffin lining	Sharp freezer	2,100,000	2,600,000	2,400,000
John T. Handy Co., Inc. Crisfield, Md.	Crisfield			Strawberries and fish	Strawberries in 30-lb. cans	Air blast	550,000 (plus 10,000 doz. soft crabs)	550,000 (plus 10,000 doz. soft crabs)	Same as 1941
Haserot Co 521 Woodland Ave., Cleveland, Ohio. [Sales factor for Northport (Mich.) Cherry Factory]	Northport	Northport		Pitted cherries	Cans, 30, 50 lb. Barrels, 450 lb	Sharp freezer	1,000,000	1,000,000	1,000,000
Henderson Bros., Inc Monticello, Ga.	Monticello			Peaches	Paper cups, 1 lb. Cans, 10, 30 lb. Barrels, 250 lb.	Sharp freezer			
Henry & Close, Inc 20 Fish Pier, Boston, Mass.	Boston	8 Bells, Land-Ho, Iceberg, Igloo		Haddock, cod, perch, flounder, scallops, whiting, pollock, mackerel	Waxed cartons, 5 lb. Wood cartons, 5, 10, 15 lb.	Birds Eye and Sharp air blast	3,500,000	5,000,000	About same as 1941
Carl N. Hewitt. Summit, Calif.	Cedar Springs, Calif	None		Strawberries, peaches, apricots, corn	Tins, inside lacquered, 1, 5 gal.; paper cartons, 2 qt. 2½ gal.	Air blast, 10 deg. below zero		20,000	40,000
Ice Delivery Co. Aberdeen, Wash.	Aberdeen and Grays Harbor, Wash	Sea Freez		Salmon, petrali sole, red rock fish, razor clams, little neck clams, dungenness crabs, oysters	Cry-O-Vac bags, paper cartons and cases	Air-blast tunnel			200,000 (Began operation)
C. S Kale Canning Co. Everson, Wash.	Everson, Wash.	Selkirk		Raspberries, strawberries	Tins, 15, 30 lb.; barrels, 50 gal.				
Keystone Cooperative Grape Association North East, Pa.	Erie, Pa.	Keystone		RSP cherries, strawberries, currants, black raspberries, grape juice, cherry juice, red raspberries	Tins (slip cover), 30 lb. Barrels, 400 lb.	Cold storage	25,969 (Plus 270,000 gal of juice)	115,000 (Plus 170,000 gal. of juice)	
Kuluz Bros. Packing Co., Inc. Biloxi, Miss.	Commercial freezers, Biloxi, Ocean Springs, Miss.	Konisur		Headless shrimp	Waxed paper cartons, 5 lb.		50,000	125,000	150,000
Lockeport Co., Ltd Lockeport, N. S., Canada	Lockeport, Yarmouth, N. S.	Seacap, Dory		Fish of all varieties, and byproducts	Cartons, 5 lb. Wooden boxes, 5, 10, 15 lb.	Sharp freezer and air blast			
Lone Star Fish and Oyster Co. 909 N. Staples St., Corpus Christi, Tex.	Corpus Christi	None		Shrimp	Cartons, 5, 10 lb	Zero temperature	100,000	100,000	150,000
R. I. MacLaughlin & Co. Box 686, Salem, Ore.	Beverton, Gresham, Ore.; Puyallup, Wash.	None		Strawberries, raspberries, blackberries, loganberries, youngberries, boysenberries, black raspberries	Barrels and cans	Commercial freezing		6,569,930	About same as 1941
Samuel Martin Game Farm 605 Union St., Seattle, Wash.	Seattle, Wash.	Wild Life in the Kitchen		Ringneck pheasants	Cans, 3 lb.; may use fiber cartons	Sharp freezer. Air blast			

Speed Up FOOD PACKING with Accurate, Rapid SCALES



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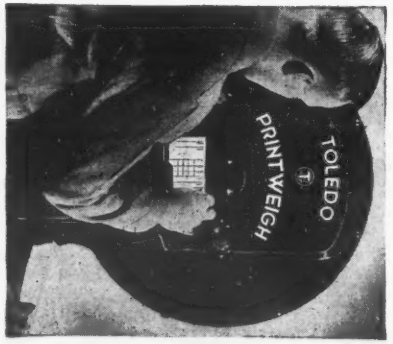
Your weight records must be right the *first* time...*every* time...OR YOU LOSE! Toledo Printweigh solves this problem with automatic *printed* weight records ... printed *directly* in *big* figures from Toledo *accurate* weights.



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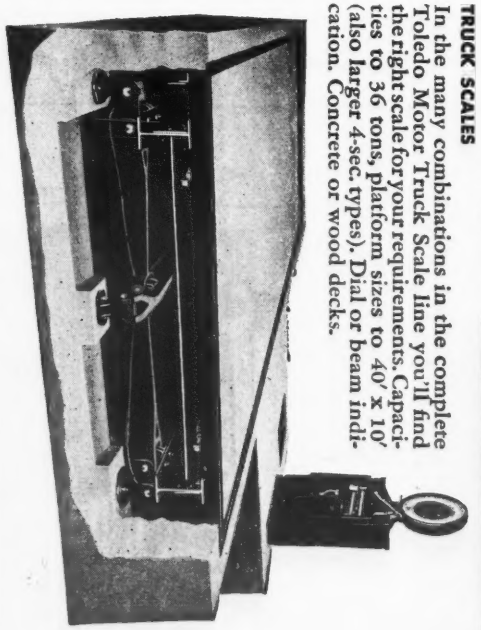
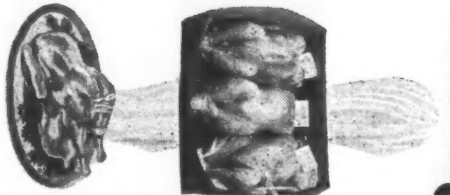
In the many combinations in the complete Toledo Motor Truck Scale line you'll find the right scale for your requirements. Capacities to 36 tons, platform sizes to 40' x 10' (also larger 4-sec. types). Dial or beam indication. Concrete or wood decks.



TOLEDO SCALES
OFFICES IN ALL PRINCIPAL CITIES

Turkeys, 44,000 lb. at Once, Quick-frozen with FRICK Refrigeration



That's a common occurrence in the big packing plant of the Jerpe Commission Co., C. A. Swanson and Sons, at Omaha, Nebraska.

Here three large Frick Refrigerating Machines hold temperatures in the freezing tunnel far below zero F. Overhead fans maintain a blast of very cold air over the poultry or other foods. (Meat, vegetables, fruit, or dairy products can all be handled with equal facility.)

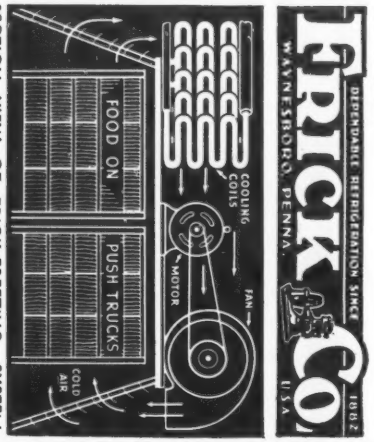
Engineering tests show that when the air blast is kept cold enough, it can absorb but little moisture from the foods. Turkeys and all other poultry come out with 99-66/100 per cent of their original weight.

Millions of pounds of fresh foods are being quick-frozen every day with Frick Refrigeration. It's the ultimate where both quality and large volume must be maintained.

U. S. soldiers, sailors, marines, and aviators use quick-frozen foods by the millions of pounds daily.

DEPENDABLE REFRIGERATION SINCE 1862

FRICK CO. WAYNESBORO, PENNA. U.S.A.



SECTION VIEW OF FRICK-FREEZING SYSTEM

FROZEN FOODS DIRECTORY SUPPLEMENT

Company	Freezing plant location	Brand	Products	Container	System	1940 output (lb.)	1941 output (lb.)	Intended 1942 output (lb.)
Martin Orchards, Inc. Sturgeon Bay, Wis.	Custom freezers	Martin's	RSP cherries	Tins, 10, 15, 30, 50 lb. Barrels, half-barrels		2,000,000	2,500,000	2,500,000
Mutual Citrus Products Co. 424 South Atchison St., Anaheim, Calif.		M.C.P.	Citrus juices	Tins, 6-gal.				
National Chip-Steak Co. Merritt Bldg., Los Angeles, Calif.; 29 Central St., Cincinnati, Ohio	Los Angeles, San Francisco, Millbrae, Calif.; Seattle, Wash.; Portland, Ore.; Oak Park, Ill.; Philadelphia, Pa.; Cincinnati, Ohio; Buffalo, Albany, N. Y.	Chip Steaks	Meat only	Waxed cartons, 5 lb.	Frick sharp-quick freezer, 40 deg. below zero; ammonia sharp freezer, 15 below	2,500,000	3,000,000	3,000,000
Omaha Cold Storage Co. 8th and Farnam St., Omaha, Neb.	Omaha	Ocoma	Poultry	Institutional and retail packs	Air blast, 15 deg. below zero	3,000,000	10,000,000	10,000,000
Paulus Bros. Packing Co. Trade & High Streets, Salem, Ore.	Terminal Ice Co., Salem.	Blue Tag	Loganberries, currants, blackberries, strawberries, red raspberries	Barrels, 50 gal.	Sharp freezer	6,000	202,680	
Pelican Cold Storage and Warehousing Co., Ltd. 1561 St. Louis St., New Orleans, La.			Fish products, crabmeat, shrimp					
H. F. Pelphrey & Son 1414 Lawrence St., Los Angeles, Calif.	Pasadena	Pel-freez	Rabbits	Paperboard	Air blast	10,000	25,000	100,000
Perry Brothers 2221 Western Ave., Seattle, Wash.			Chicken	Cartons with transparent window				
Priebe & Sons, Inc. 110 North Franklin St., Chicago, Ill.	Perry, Sac City, Iowa	Priebe	Poultry (broilers, fryers, roasters, fowl, turkeys)	Retail: Waxed cartons, transparent wrapper. Institutional or bulk packages: Individual birds wrapped in vegetable parchment				
Red Wing Co., Inc. Fredonia, N. Y.	Fredonia		Strawberries, cherries, raspberries, plums	Barrels. Tins, 30 lb.	Sharp freezer			
Rockingham Poultry Market Co-op., Inc. Broadway, Va.	Broadway, Va.	Rockingham, Shenvalley	Peaches, Poultry	Peaches: Tins, 30 lb. Poultry: Boxes, ½-doz. size; barrels, 150 lb.	Air blast, 25 deg. below zero	None	2,430,000	4,000,000
Salter Canning Co. North Rose, N. Y.			RSP cherries, strawberries	30-lb. containers		176,000	43,000	
Trans-Oceanic Fisheries 2 Broadway, New York, N. Y.	New York, N. Y.; Capetown, South Africa; Galveston, Tex.; Biloxi, Miss.; Liverpool, N. S., Montreal, Canada; Ma-	Clipper, Taf, N.B.C. Mersey Loch Fyne, Tok, Trans O	Lobster tails, cod, haddock, flounder fillets, smoked cod fillets, kippers, mackerel, scallops, bluefish, shrimp, smelts, other seafoods	Cartons, 5 lb. Wooden boxes, 20, 30 lb.	Birds Eye, "Z," sharp freezer			

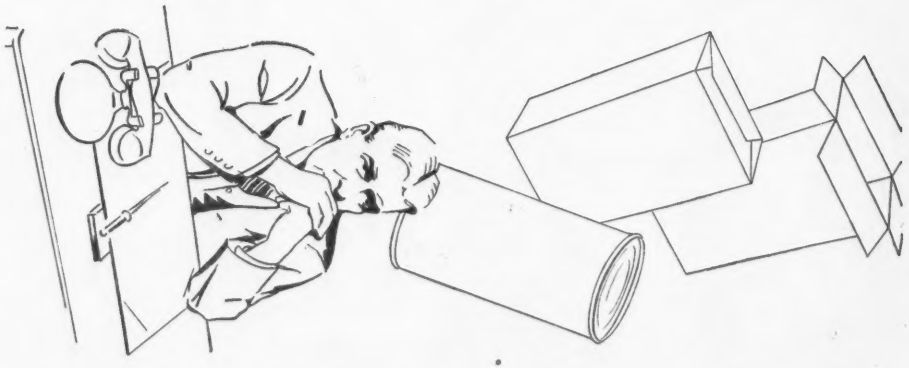
Trans-Oceanic Fisheries 2 Broadway, New York, N. Y.	New York, N. Y.; Capetown, South Africa; Galveston, Tex.; Biloxi, Miss.; Liverpool, N. S., Montreal, Canada; Manasquan, N. J.; Green Bay, Wis.	Clipper, Taf, N.B.C., Mersey Loch Fyne, Tok, Trans O	Lobster tails, cod, haddock, flounder fillets, smoked cod fillets, kippers, mackerel, scallops, bluefish, shrimp, smelts, other seafoods	Cartons, 5 lb. Wooden boxes, 20, 30 lb.	Birds Eye, "Z," sharp freezer	.....	.....	.....
Union Trade & Packing Co. Ketchikan, Alaska	Petersburg, Alaska (Public cold storage)	U.T.P.C.	Salmon	Wooden boxes, 100, 200 lb.	Sharp freezer	130,000	20,000	100,000
Washington Frosted Foods 71 Spring St., Kent, Wash.	Kent, Ballard, Wash.	Penguin, Green Bow	Strawberries, blackberries, raspberries, cherries, etc. Spinach, corn, broccoli, peas, peaches, cauliflower, brussels sprouts, asparagus	Cartons with transparent cellulose liner, waxed overwrap, 12 oz., 1, 2½, 5 lb. Cans, 10, 30 lb. Barrels, 50 gal. Cry-O-Pac bags, 30 lb.	Sharp freezer, air-blast, 3-stage system (Cahill), 32 deg., 10 deg., minus 10 deg.	1,900,000	2,100,000	3,100,000
Wegner Canning Corp. Sodus, N. Y., Eustis, Fla. Sales Office: 100 Hudson St., New York, N. Y.	Sodus, Williamson, Wolcott, Ontario, N. Y.	Wegner	Cherries	Tins, 30, 50 lb.	Quick freezing 40 deg. below zero	.....	.....	.....
E. A. Weilbacher Co. 1300 Factory Place, Los Angeles, Calif.	.....	Finest Food	Apricots, peaches	All sizes, 5, 10, 20, 50 lb.	.....	.....	No pack in 1941	.....
Westfield Planters Cooperative Fruit Products, Inc Westfield, N. Y.	Westfield	None	Cherries, strawberries, peaches, currants, raspberries	Tins, 10, 15, 30 lb. Barrels.	Sharp freezer	.....	100,000	.....
Whidby Island Berry Growers' Assn. Langley, Wash.	Langley, Wash.	None	Strawberries	Tins, 10, 30 lb.; barrels, 50 gal.	Sharp freezer	250,000	275,000	300,000
Sherman White Packing Co. Fort Wayne, Ind.	Fort Wayne	Birds Eye	Ready-to-cook poultry	Birds wrapped in transparent cellulose	Birds Eye	(Output distributed by Frosted Foods Sales Corp.)		
W. M. Wogman R. 1, Box 418, Sebastopol, Calif.	Cold storage, Sebastopol.	Amber Glow	Cider	Glass jugs, 1 gal.	Slow freezing at zero	.....	700 gal.	More than in 1941

ADDENDA TO FROZEN FOODS DIRECTORY

The information listed was received too late to be included in alphabetical order in the main part of the directory starting on page 80

Company	Freezing plant location	Brand	Products	Container	System	1941 output (lb.)	1942 output (lb.)	1943 output (lb.)
Marine Products Co. Hancock & Harasthy Sts., P. O. Box 431, San Diego 12, Calif.	San Diego, Calif.	Ocean Garden, Gulf of California	Shrimp, Pismo clam meats	Shrimp packed 10 to the case in 5-lb. fiberboard cartons; clams, 8, 2-lb. tubs to the case	Sharp freezer and air blast	.....	.....	.....
Paragon Packing Co. Astoria, Ore.	Astoria, Portland, Ore.	Paragon	Halibut, salmon and all fillets	5-lb. bricks; 5-lb. packages, 20 lb. to carton, transparent wrapper	Sharp freezer, 10 deg. below zero	385,000	500,000	750,000
San Juan Fishing & Packing Co. Foot of Stacey St., Seattle, Wash.	Seattle, Wash.	San Juan	Fillets: Halibut, sole, cod, red rockfish, salmon. Also pack all these items as whole fish	5-lb., 10-lb. blocks, no package. 5-lb. cartons. Cartons contain 5 parcels; transparent wrapper	Sharp freezer; York air blast, 40 deg. below zero	6,000,000	5,500,000	4,000,000
Waldport Sea Food Co., Inc. P. O. Box 97, Newport, Ore.	Newport	Waldport, Pacific Spray	Crabmeat	Tins, 1, 5 lb.; cartons, 7 lb.	Cold pack	.....	164,420	160,000

LOOKING AHEAD...



No merchandiser is fooled by the ease with which his product sells nowadays. Abnormal conditions are always temporary. That tough Buyer's Market may be just around the corner.

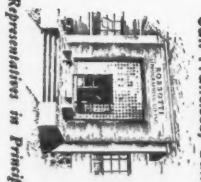
Buying habits are being formed today as always. Mrs. Consumer, whether consciously or unconsciously, continues to make a bee-line for Quality—and Quality is unmistakably typified by a distinctive, appetite-whetting package.

The Rossotti organization offers you a completely integrated service on fine Labels, Package Wraps and Folding Cartons—from sketch to finished product. Complete Art, Idea, and Merchandising Counsel.

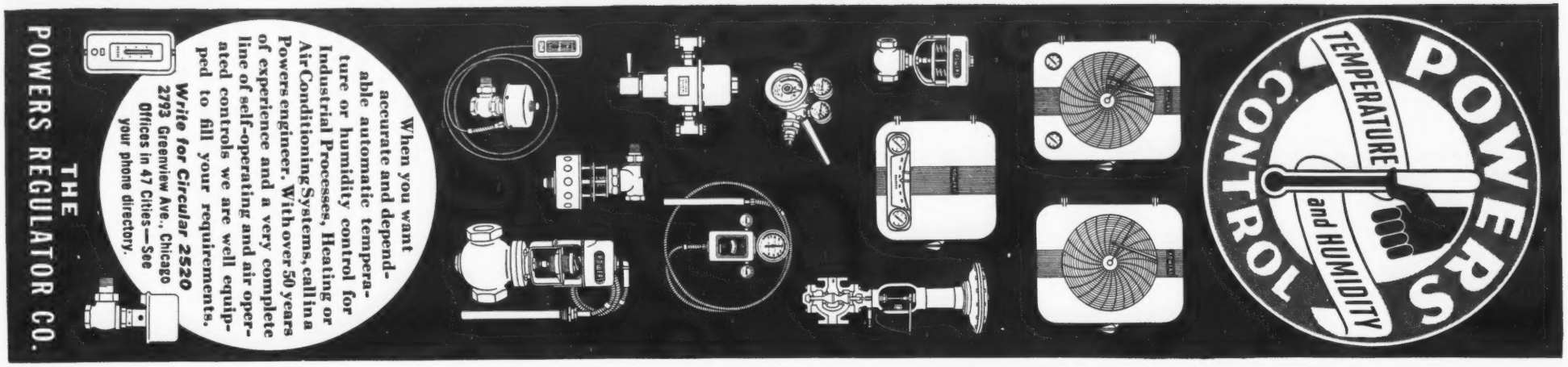
Why not call in a Rossotti Packaging Man for a constructive discussion of your individual requirements? Or drop us a line at our North Bergen Plant. No obligation at any time.

ROSSOTTI LITHOGRAPHING COMPANY, INC.
NORTH BERGEN, NEW JERSEY

West Coast Division
Rossotti West Coast Lithographing Corporation
San Francisco, Cal.



Sales Representatives in Principal Cities


THE POWERS REGULATOR CO.
When you want accurate and dependable automatic temperature or humidity control for Industrial Processes, Heating or Air Conditioning Systems, call in a Powers engineer. With over 50 years of experience and a very complete line of self-operating and air operated controls we are well equipped to fill your requirements.
Write for Circular 2520
2793 Greenview Ave., Chicago
Offices in 47 Cities—See your phone directory.
POWERS
TEMPERATURE and HUMIDITY CONTROL

THESE COMPANIES ALSO FREEZE FOODS

(Names and addresses of companies known to be engaged in commercial freezing operations but for which no detailed data are available.)

Bama Co.
616 7th St., Birmingham, Ala.

G. A. Barem
828 13th St., S. E., Puyallup, Wash.

Barker Cold Storage Co.
Barker, N. Y.

Bercut-Richards Packing Co., Inc.
Sacramento, Calif.

Blue Lake Producers, Co-op.
Salem, Ore.

Bridgman-Russell Co.
Duluth, Minn.

Jos. Buchwald & Co.
855 McAllister St., San Francisco, Calif.

Cloverdale-Lewis River Co-op.
Kalama, Wash.

Cold Storage & Fruit Terminal
Mobile, Ala.

M. F. Combs Co.
Puyallup, Wash.

Commando Foods, Inc.
Webster, N. Y.

E. J. Esses
Montesano, Wash.

Eugene Fruit Growers Association
Eugene, Ore.

Good Cannery
1303 S. Gold St., Centralia, Wash.

Greencastle Packing Co.
Greencastle, Pa.

Hammond Packing & Cold Storage Co.
Hammond, La.

C. & E. Hanover Grape Growers Co-op. Association
Silver Creek, N. Y.

Hartman Canning Co.
Macedon, N. Y.

Earl Howell
Newfane, N. Y.

Kerr Conserving Co.
1835 S. E. 10th Ave., Portland, Ore.

P. Knudsen
Mount View, Calif.

Carl M. Limpert
Westlake, Ohio

Maine Cold Storage
Bangor, Me.

M. W. Miller & Co.
Garland St., Sturgeon Bay, Wis.

Modesto Refrigerating Co.
Modesto, Calif.

Peter H. Moll
Ontario, N. Y.

John C. Morgan Co.
102 Bay St., Traverse City, Mich.

Muskegon Berry Growers, Inc
Muskegon, Mich.

Charles Neubert Strawberry Co., Inc
114 E. York St., Baltimore, Md.

Oceana Canning Co.
Shelby, Mich.

A. Olender & Son
1400 14th St., Detroit, Mich.

Olympia Canning Co.
Columbia & A Sts., Olympia, Wash.

Oregon Fruit Products Co.
Salem, Ore.

Palmer Frozen Foods Co., Inc.
Waukesha, Wis.

Allen Parrish
National Ice Bldg., Stockton, Calif.

Pomena Products Co.
Griffin, Ga.

Portland Canning Co.
4757 N. E. Wasco St., Portland, Ore.

Prime Canning Co.
Box 335, North Collins, N. Y.

Grant L. Pugh
Lockport, N. Y.

Quality Apple Products Co.
3559 Croton Ave., Cleveland, Ohio

Quincy Market Cold Storage Co.
Boston, Mass.

Ray-Maling Co., Inc.
Hillsboro, Ore.

W. H. Roberts & Co.
1001 S. Lakewood Ave., Baltimore, Md.

Santa Cruz Fruit Packing Co.
1175 57th Ave., Oakland, Calif.

Sebastopol Berry Growers Association
Sebastopol, Calif.

Seven Pines Farm
Majestic Bldg., San Antonio, Tex.

Smith Canning Co. of Oregon
Pendleton, Ore.

Snohomish County Berry Growers Association
Marysville, Wash.

Sodus Fruit Exchange
Sodus, Mich.

Stephens & Laurel Co.
Detroit, Mich.

Tea Garden Products Co.
755 Sansome St., San Francisco, Calif.

A. J. Todkill
Barker, N. Y.

J. G. Townsend
Wilmington, N. C.

United Growers, Inc.
Salem, Ore.

Victor Preserving Co.
Ontario Center, N. Y.

Welkley Bros.
East Rochester, N. Y.

These companies are reported to be freezing, but verification has not been obtained.

Berrien Country Fruit Exchange
Stevensville, Mich.

Fennville Fruit Exchange
Fennville, Mich.

H. L. Forhan Co.
Portland, Me.

Gould Fruit Products
480 Lake Ave., Rochester, N. Y.

Helen Packing Co.
North Collins, N. Y.

Herman Fruit & Vegetable Co.
856 Portland Ave., Rochester, N. Y.

E. B. Holton
Webster, N. Y.

S. P. Matheny
Sublimity, Ore.

R. M. Mesler
Gasport, N. Y.

Ohio Fruit Products Co.
2704 E. 34th St., Cleveland, Ohio

Orem Berry Growers, Inc.
Provo, Utah

C. Orser Co., Inc.
Poplar, Wis.

Pacific Food Products, Inc.
815 Adams St., Seattle, Wash.

J. M. Smucker Co.
Orrville, Ohio.

B. F. Stevenson
Stevenson Land Co., Detroit, Mich.

Terry Haute Fruit & Vegetable Growers
Terry Haute, Ind.

Good Cannery
1303 S. Gold St., Centralia, Wash.

Charles Neubert Strawberry Co., Inc
114 E. York St., Baltimore, Md.

Santa Cruz Fruit Packing Co.
1175 57th Ave., Oakland, Calif.

Berrien Country Fruit Exchange
Stevensville, Mich.

Terry Haute Fruit & Vegetable Growers
Terry Haute, Ind.

1943

Leading State Colleges
have checked the
STEINLITE
Moisture Tester

You are invited to study the results of their investigations

The Special 40 gr. STEINLITE One Minute Moisture Tester

FREE TRIAL OFFER

The Steinlite is sold on a ten day free trial basis to enable you to check it in your own plant on your products. No down payment required. When writing; tell us about your products, moisture ranges, tolerances required, etc.

The Steinlite electric moisture tester is being successfully used as a production control instrument in dehydrating carrots, soups, eggs and other food products.

1. ACCURATE: The Steinlite is Calibrated against official Government oven moisture testing methods. Manufactured by electrical engineers . . . . pioneers in the radio field. Operates on radio frequency impedance principle.

2. FAST: A Moisture test is made by an experienced operator in about one minute. But even if it takes an inexperienced operator 2 or 3 minutes . . . . that's a tremendous saving compared with other methods.

3. EASY TO USE: Weigh out sample, pour it in the Steinlite hopper, press button, compare with a conversion chart and you have the answer.

STEINLITE . . . . the choice of those who know Moisture Testers best.

"HEADQUARTERS" For Moisture Testers
Broad Line of Testing Equipment.

Send for Seedburo Catalog No. 143

SEEDBURO
EQUIPMENT COMPANY

Formerly SEED TRADE REPORTING BUREAU FOUNDED 1912

More than 40,000 Steinlites in use

634 BROOKS BLDG. CHICAGO 6, ILL.

NEW PACKAGES & PRODUCTS

Something for the Boys

SOLDIERS in the first line fighting zones, where there may be no cooks, cooking equipment or dependable supply routes, are now eating corned beef hash—a typically American dish—as part of the new 10-in-1 ration. Prepared by Wilson & Co., Chicago, Ill., the hash not only is dehydrated by a new process, but is precooked and compressed in cans and is at least the equal in taste, nutritive value and appearance to the kind the soldiers "used to get at home." Moreover, it is easily prepared in only 10 minutes after the addition of water.

The new dehydrated corned beef hash contains top-grade Army approved beef that has been cooked in its own fats and juices, precooked shredded potatoes and onions, flavors and spices. The hash is vacuum packed, and is compressed into the cans under a pressure of 1,200 lb. per square inch. The cans contain 13 oz., enough when rehydrated to provide generous portions for five soldiers.

In the picture above, Brig. Gen. J. E. Barzynski, commanding general of the Chicago depot of the Quartermaster Corps, samples the new product with Edward Foss Wilson (left), president of Wilson & Co., and Thomas E. Wilson, chairman of the board.

The Pepper Department

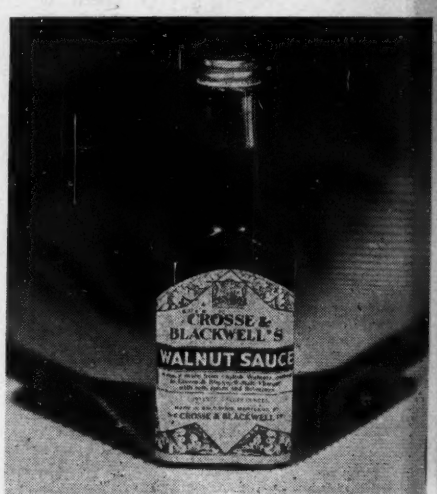
SOME like it hot—and these are the people who are flocking to New York groceries for the roasted peppers bottled by Mancini Packing Co., New Britain, Conn. Specially prepared, with salt added, the peppers are packed in a 7½-oz. glass jar with a "Flip Seal" cap. Tabasco peppers in distilled vinegar are packed in a 3-oz. tapered glass bottle by B. F. Trappey's Sons, Inc., New Iberia, La. A paperboard liner in the screw cap can be removed so that the sauce may be sprinkled through a hole in the center of the cap.

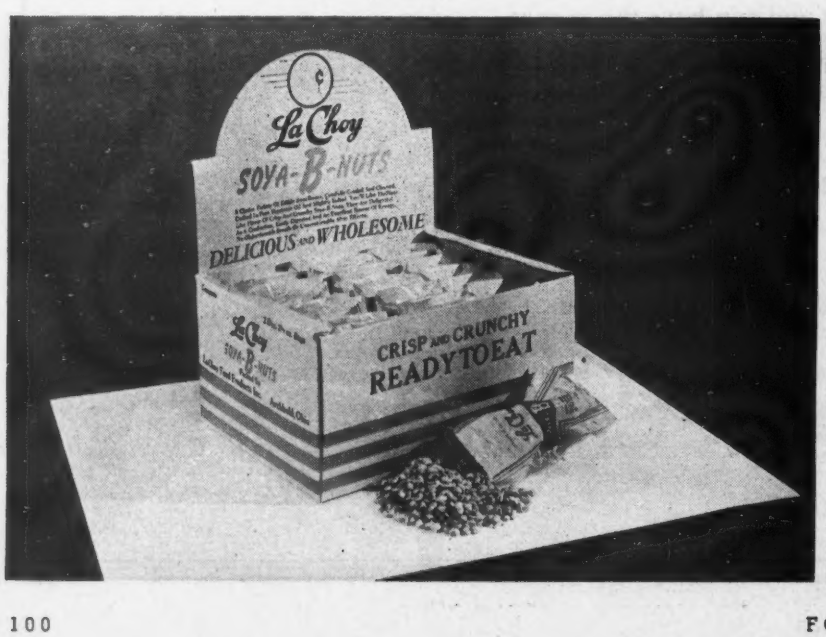
Soya Confections

RECENTLY introduced by La Choy Food Products, Inc., Archbold, Ohio, "Soya-B-Nuts" are packed in 2½-oz. waxed paper bags and offered as a confection just as candy and peanuts are sold. The nut-like variety of edible soybeans is graded and cleaned, cooked in pure vegetable oil and slightly salted, ready to eat.

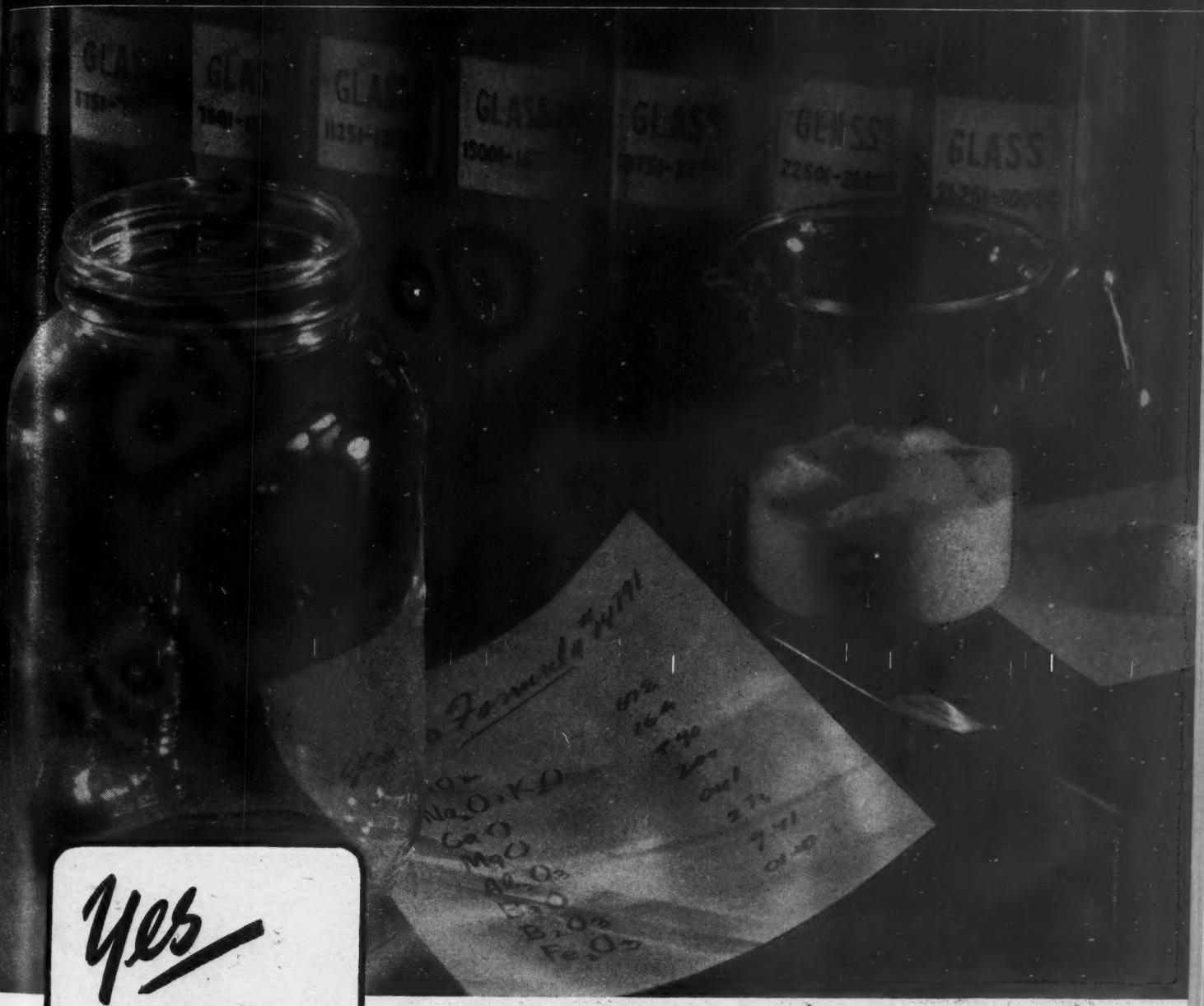
From English Tables

PLEASANTLY nostalgic of the English scene is Crosse and Blackwell's walnut sauce made in Baltimore, Md., from imported English walnuts. This newest product in a distinguished line is extracted from selected English walnuts, cooked until tender in specially flavored malt vinegar. The ration-conscious





YOU CAN MAKE IT 30,000 DIFFERENT WAYS



Yes THERE'S A DIFFERENCE IN GLASS

NEXT time you're talking to someone about glass, ask him just for fun how many different kinds of glass he thinks there are. Unless he's a trained glass chemist, we'll wager his eyes will pop when you tell him that there are actually as many as 30,000 different glass formulas.

Not all of these formulas are commercially used, of course. Yet glass manufacturers regularly melt as many as 300 different glass mixtures . . . use over a hundred different ingredients (besides sand) in these compositions. Some of these ingredients are used in ton quantities, while only a few grains of others are needed.

Amazing, isn't it? And even though your interest in glass may be confined to one special line—container glass—the fact that there are so many ways to make glass is important to you. For it proves, beyond question, that there *is* a difference in glass.

This difference shows itself in many ways . . . such as degrees of brilliance, clarity, thermal shock resistance, and so on. Individually these differences may not be important, but all taken together, they add up to the big difference between run-of-the-mill ware and top-quality glass. And *that* difference is important to you.

For a graphic description of the facilities and skills that go into the making of high-grade container glassware, send for your copy of Armstrong's booklet, "Men and Glass." It's free. Just write Armstrong Cork Co., Glass and Closure Div., 4211 Prince Street, Lancaster, Penna.

ARMSTRONG'S GLASS

and **ARMSTRONG'S CLOSURES**

SALES TALK... FROM A KITCHEN TABLE

THOSE lithographed Armstrong's Metal Caps are doing a smart bit of selling as they lie on the kitchen table. They are reminding Mrs. Consumer of their brand name. And they repeat that reminder every time she removes and replaces them.

That's one reason why lithographed Armstrong's Metal Caps are going on more food packages these days. But there's another important reason, too. Caps with bright colors and attractive designs make standardized glass containers stand out in *stores*. They make it easier for customers to see, and buy, your products.

It costs little to add this extra selling factor to your packages. It's easy, too. Just send us your packages. We'll send you back a cap design that will help build sales economically. There's no obligation.

In fact, if you have *any* glass packaging problems, let us know what they are. We may be able to help you with containers as well as closures. Just write Armstrong Cork Company, Glass and Closure Division, 4211 Prince Street, Lancaster, Pennsylvania.

The Army-Navy "E" and Star have been awarded to the men and women of Armstrong's Closure and Floor Division Plants for excellence in the production of such war materials as cartridge cases, shells, bombs, and aircraft sub-assemblies.

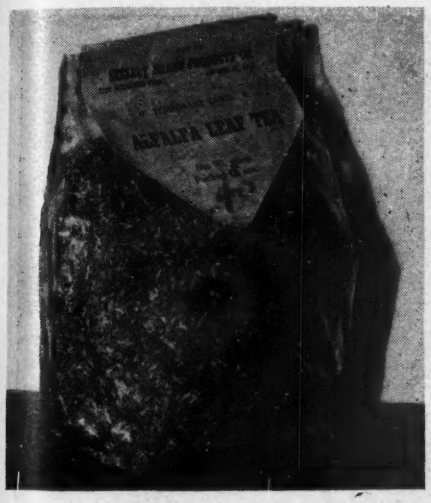
ARMSTRONG'S CLOSURES

Turn standard containers into standout packages

housewife will welcome the walnut sauce as an addition to cold meats and fish, and as a piquant flavoring in soups, stews and gravies. . . . It seems to belong to the great banqueting tables of King Arthur's time, with the boar's head, venison and blackbird pies.

Tea from Alfalfa

APPARENTLY everything flourishes in California—Hollywood, hermits, religious sects, and any agricultural commodity you can mention. Latest product



to be shipped east from that sunny land is alfalfa leaf tea, packed by Seelect Brand Products Co., Los Angeles, Calif., in a bag-within-a-bag of transparent cellulose with the label stapled over the top. The alfalfa tea is prepared just as ordinary tea, with hot water and lemon or honey to season.

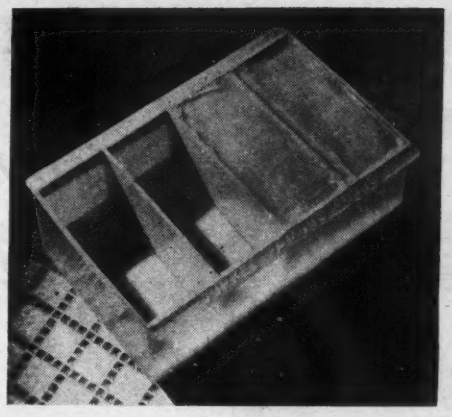
Blended Shortening

TWENTY-FIVE YEARS on the market, Swift & Co.'s "Jewel" shortening appeared last month in a new guise, a laboratory blend of both animal fats and vegetable oils. The new scientific blend of animal fats and vegetable is said to retain the best points of both shortenings—the essential fatty acids found in meat fat and the greater plasticity of the vegetable product.

After hundreds of basic tests, Swift & Co.'s chemists developed the new "Jewel" shortening by a precision formula, blending the fats in exact proportions to give a shortening to perform to certain set standards. Trial tested in the deep South, the shortening won high favor before going into general distribution.

Margarine Mold

AN easy-to-clean, nonshattering Lumarith plastic molding dish has been developed to give margarine more eye appeal. Although purchasers of margarine are supplied with a color tablet

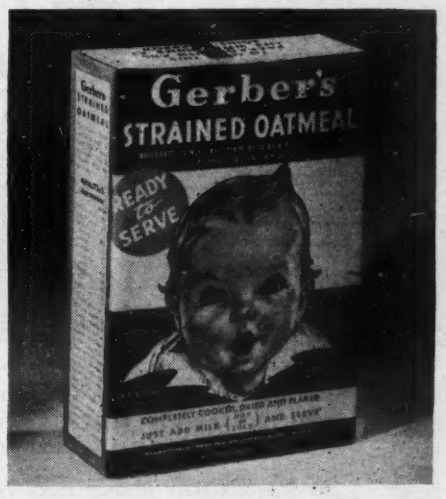


which can be mixed in to give the familiar yellow butter color, the margarine still lacks the bar shape that packaged butter comes in today.

"Durkee Famous Foods" and several other companies have adopted the molding dish made by Allied Plastics, Los Angeles, Calif., which is equipped with three dividers and four removable bottom pieces. After the margarine has been placed into the mold and returned to the refrigerator to harden, it takes the form of the conventional butter bar and can be removed, a bar at a time, by pushing up the bottom.

Package Protection

GERBER PRODUCTS CO., Fremont, Mich., is seeing to it that the nation maintains its record of best nourished



babies. A new 8-oz. paperboard package of Strained Oatmeal is now available to mothers who are using cereal as the first step away from the baby's formula. The strained cereal, made of oatmeal, malt sirup, dried brewers' yeast, dicalcium phosphate, salt and iron salt, is completely cooked, dried and flaked, ready to be served with the addition of milk.

Gerber's strained oatmeal, developed specially for babies with the aid of experts in infant nutrition, is packaged in a heavy inner bag within a carton which has the added protection of a sealed outer wrapper.

FOR EVERY AVAILABLE TYPE OF PAPER FOOD PACKAGING

. . . here's your

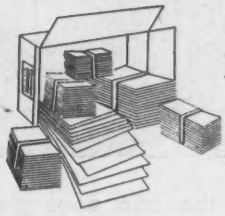
INFORMATION • CENTER

When you write us regarding the packaging of a item that can be packaged in paper, you can expect to receive data and samples embracing *all* suitable types of paper packagings available for the purpose.

Today, with "available" materials subject to frequent change by restrictive orders and shortages, there's more reason that ever to rely on a supplier who is not limited to any one or any group of materials but works with *all* — cellophane, glassines, transparent and opaque papers in all types and laminated combinations.

. . . and for operators of

DEHYDRATING & LOCKER PLANTS



We offer this Family Carton of 150

"PAKSURE-SAKS"

(Copyright — 1943)

It's NEW . . . this assortment of 3 popular sizes of bleached kraft bags lined with heat-sealing cellophane. A year's supply for the average family. "PAKSURE-SAKS" are moisture-proof, odor-proof, grease-proof and air tight. Excellent for either dehydrated or frozen foods. Wire for prices and discounts.

Packaging Division
E. W. TWITCHELL Inc.

777 Public Ledger Bldg., Phila. 6, Pa.

Specialists in
Special-Purpose Paper Packagings

Cooking with Beer?

Well, the can does look familiar! But the product *isn't* . . . unless you're versed in the culinary art!

It's a Crown fabricated type beer can all right! But this time it contains Tournade's Kitchen Bouquet especially packed for the use of our overseas forces.

This concentrated sauce has long been popular with army cooks as well as with civilian chefs for flavoring and enriching gravies, stews and soups . . . so Crown was called upon to furnish a container that would assure its safe transportation to kitchens set up in the combat zones.

So the Crown fabricated type beer can took on the job . . . not in its regular line of duty . . . but in a special wartime capacity . . . another demonstration of Crown's ingenuity in meeting military demands!

CROWN CAN COMPANY, New York • Philadelphia. *Division of Crown Cork and Seal Company,* Baltimore, Md.

★ ★ CROWN CAN ★ ★

Supply of Fats and Oils Becomes More Plentiful

Improved shipping conditions, increased production and wider use of substitutes are factors

FATS AND OILS are easy again. The September announcement of a 28 percent increase in soap production for civilian use was one of the first indications of the situation. At the time of the announcement, the War Food Administration gave this explanation: "The increase in soap output will be made possible by improved shipping conditions which permit the importing of more fats and oils; by increased production of domestic animal fats and vegetable oils; and by the more general use of rosin and other soap materials as substitutes for fats."

For the last quarter of this year 11,746 tank cars of edible oils have been allocated, divided as follows: Cottonseed, 5880; peanut, 528; soybean, 4391, and corn, 947. And releases have been made for these specific purposes:

1. For the estimated portion of the Food Distribution Order 42 quota for margarine and "other edible finished products" to be manufactured during the allocation period —9,877 cars.
2. For delivery to other margarine, shortening and oil manufacturers—1,235 cars.
3. For Army, Navy, Marine Corps, War Shipping Administration, Lend-Lease and Food Distribution Administration purchases—469 cars.
4. For industrial users—165 cars.

This year the United States will be a net exporter of fats and oils for the first time since 1924. Government reports show domestic disappearance, including military as well as civilian use, to be less than the sharply increased domestic production that has been achieved since 1939. Curtailment of domestic uses, loss of imports from the Far East and large shipments to our allies were given as the reasons for the United States becoming an exporter.

Prospects for 1944

Prospects for 1944 for both production and use of fats and oils were officially summarized in late September by the Bureau of Agricultural Economics:

"Production of fats and oils from domestic materials may total about 11.6 billion pounds in the 1943-44 crop year compared with about 11 billion pounds in the calendar year 1943 and 10 billion pounds in 1942. Further expansion in oilseed acreage probably will take place in 1944. But animal-fat production, with a smaller pig crop expected next year, is likely to be curtailed beginning in the fall of 1944. Reduced output of animal fats in the 1944-45 season may more than offset increased output of vegetable oils.

"Domestic disappearance of fats and oils increased from 9.6 billion pounds in 1939 to 10.9 billion pounds in 1941, but has since declined. With government limitation orders and rationing of food fats in effect, disappearance in 1943, including military use, will total about 10 billion pounds. In 1944, domestic disappearance will be nearly the same as it has been in 1943."

It is obvious that the improved shipping situation lies back of this and other pleasant news where offshore imports enter into the supply picture. It was announced by the WPB Stockpiling and Transportation Division that imports into this country during the second quarter of this year increased 3,000,000 tons over the first quarter, with June arrivals being almost twice as great as those in January.

Inventories of glycerine have also improved along with the shipping situation, with the result that small quantities have been released for civilian uses. Definite inventory requirements have been established for glycerine by the War Food Administration. Excess quantities are being released even though small. The small amount available is being shared by manufacturers of dentifrices, flavors, shaving cream, adhesives, tobacco, shortenings, crown caps and protective coatings. It is becoming evident that the quantities of fats and oils available for industrial use are now sufficient to meet the minimum requirements for glycerine production without depending upon the salvaging of used household fats.

Early in October the improvement of inventories resulted in action by the WFA to suspend the allocation of animal oils. At the same time restric-

MINNESOTA TOWN SUPPLIES FOOD LABOR

In spite of the manpower shortage facing all agriculture and food processors, the town of Fairmont, Minn., cooperated with Birds Eye Frosted Foods to contrive a way to bring every ounce of produce from the fields, quick freeze them, and thereby help fulfill the tremendous demand for these foods. Fairmont called its efforts the Victory Crop Drive, enlisting the aid of the town's 7,000 persons in a community mobilization to meet the emergency. Mrs. William Roehler, wife of the county sheriff, and her daughters, Charlotte and Adela, pictured above, are typical of the hundreds of women in the city who have joined in the Victory Crop Drive.

tions were relaxed on the use and delivery of castor oil for the rest of the year, with the statement that inventories had risen to a satisfactory level and prospects for continued improvement were good, "in view of improved shipping conditions."

Industrial Quotas Raised

By mid-October, the improved fats and oils situation had resulted in an amendment to FDO 42, setting higher quotas for industrial uses. These amendments indirectly affect food manufacturers by returning the manufacture of enamels and coatings for metal food containers, closures and closure liners to its original classification—with paints, varnishes and lacquers—permitting an interchange of use with all these products, based on 60 percent of 1940-1941.

Pickle Packers Report 1943 Crop Decline

WITH a 1943 intake of over 2,000,000 bu. of cucumber pickles less than in 1942, members of the National Pickle Packers Association met on October 14, in Chicago, to make plans for 1944.

Although early frosts in Michigan and Wisconsin, the largest pickle-growing states, cut the 1943 crop considerably, the greater part of the shrinkage in the production of pickles is attributed to other factors. These include governmental curbs and restrictions, which cut both the acreage planted and harvested, and failure to defer from military service key men in finishing plants even though the armed forces consume about one-fourth of the yearly crop.

According to crop reports from 66 members of the Association, representing 56.33 percent of total acreage contracted, their 1943 intake is 3,296,292 bu.; a yield of 67.07 bu. per acre. Projected as the yield from the total acreage contracted, the national 1943 intake is estimated at 5,911,571 bu. The 1942 intake was approximately 8,000,000 bu.

This intake, plus the carryover from the 1942 crop, gives an Oct. 1, 1943, inventory of 7,666,523 bu. compared with an Oct. 1, 1942, inventory of 8,183,169 bu. Consumption from Oct. 1, 1942, to Oct. 1, 1943, was reported to be 3,428,217 bu., about 1,000,000 bu. less than for the previous 12-month period.

Plans for 1944 call for early negotiation with farmers on the 1944 acreage to be contracted and the price per bushel, with OPA adjustment of price ceilings, with proper government agencies for adequate labor, even to the employment of war prisoners. Container specifications will be studied to simplify container problems.

Army and Navy Explain Food Packaging Needs

CURRENT packaging problems were discussed and the progress made on previously presented problems was reported at the Army and Navy requirements conference sponsored by the Technical Association of the Pulp and Paper Industry, at Chicago, September 21–24.

Movies taken in the South Pacific war zone showed concrete examples of the need for adequate packing protection. Exhibits by various divisions of the armed forces explained correct and incorrect packing practices and the advances that have been made in conserving shipping space through improved packaging and packing.

Robert R. Melson, of the Subsistence Research Laboratory, reported that notable progress had been made with the adoption of the combination container-bag-shipping case method of packing but said that many problems still remained unsolved.

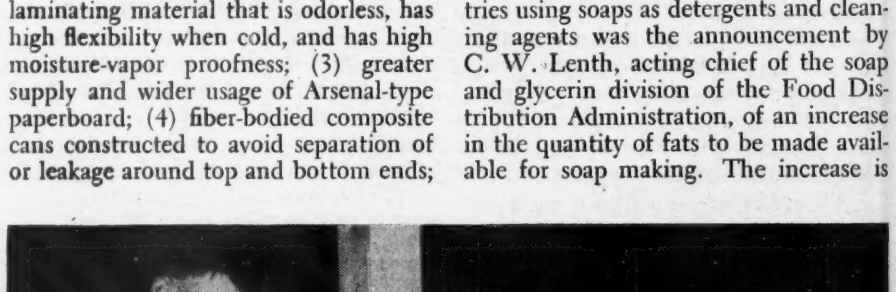
Present-day problems involve: (1) Greater supply of water-tight laminated bags for bulk packing of unit packages; (2) alternate or greater supply of asphalt laminating material that is odorless, has high flexibility when cold, and has high moisture-vapor proofness; (3) greater supply and wider usage of Arsenal-type paperboard; (4) fiber-bodied composite cans constructed to avoid separation of or leakage around top and bottom ends; (5) heavier sheet for kraft lamination to make improved containers for 5- and 10-lb. packages, and (6) more information on gas packaging in flexible type containers.

C. A. Southwick, Shellmar Products Co., Mt. Vernon, Ohio, stressed performance as the deciding test for functional materials such as liners, wrappers, and the like. Suggested performance tests include: (1) Folding, (2) Creasing (dynamic folding), (3) surface abrasion for durability, (4) stretching to determine stress resistance or elongation, and (5) aging to determine stability during storage or when subjected to temperature changes.

Oil Chemists' Society Holds Fall Meeting

INTENSE INTEREST in present-day fats and oils problems was reflected in the record-breaking attendance at the 17th Fall Meeting of American Oil Chemists' Society, in Chicago, October 6-8. The registration of more than 425 exceeds other registrations by more than 33 1/3 percent.

Of particular interest to all industries using soaps as detergents and cleaning agents was the announcement by C. W. Lenth, acting chief of the soap and glycerin division of the Food Distribution Administration, of an increase in the quantity of fats to be made available for soap making. The increase is



NONMELTING BUTTER FOR THE TROPICS

Made in Australia, tins of tropical butterfat spread are shown ready for tropical battle areas and operational zones. This butter keeps its quality without refrigeration, is reconstituted when made and then canned. Processed only in Australia, the butter has 100 percent food value and contains no water, compared with 16 percent in ordinary butter. The spread is obtained by dehydrating creamery butter and extracting the pure butterfat. This is boiled and to it is added a small quantity of salt, skim milk powder, flavoring and 19 percent hydrogenated butterfat, to increase the melting point to 105 deg. The mixture is packed in 1- or 5-lb. cans and sealed under vacuum.

HEADS FOOD RATIONING

Walter F. Straub, founder and president of W. F. Straub Co., Chicago, Ill., food product and pharmaceutical manufacturers, is the new director of OPA's Food Rationing Division. Mr. Straub is also a large producer of honey and a member of that industry's WFA Advisory Committee. He is a director of College Inn Foods Products Co., of Wieboldt Stores, Inc., Chicago, and is consultant for H. J. Heinz Co., Pittsburgh.

to be from 80 percent of the 1941 average usage to 90 percent for household soaps, 110 percent for industrial soaps and 150 percent for mechanics' hand soaps.

Announcement was also made of the release of glycerine for nonwar use; release orders have been given for 16,000,000 lb.

The statement was made that fat salvage in the homes is yielding about 8,000,000 lb. of fat per month, which is about 5 percent of total inedible fat need and only about 40 percent of the estimated quantity that might be obtained.

M. W. Hinson, fats and oils consultant, salvage division, WPB, reported results of a survey that indicates a total of 350,000,000 lb. of fats and oils to be found in industrial waste materials. Recovery to date is between 75,000,000 and 90,000,000 lb., coming to a large extent from meat packing plant wash water, smoke houses, dump materials and stockingette wrappings.

E. N. Mortenson, Swift & Co., Chicago, outlined a procedure by which recoverable fat losses in plant waste waters might be determined. Models of recommended settling basins and traps were exhibited.

J. C. Cowan, Northern Regional Research Laboratory, Peoria, Ill., reviewed the work done on polyamides from polymerized soya oil acids and described the properties and test performance of a resulting resin-like plastic that shows promise of becoming a synthetic protective coating, particularly for papers and food packaging materials.

Surgical Silk

A recent addition to the many War Products being wrapped on our Machines

Like many another manufacturer seeking a fast, practical way to package products for the armed forces, the makers of Deknatel Surgical Silk found the answer in one of our adjustable wrapping machines . . . Placed in an open boat, and wrapped in moisture-proof cellophane on our FA, both sizes of spools are readily accommodated.

Wartime wrapping problems are providing a valuable source of ideas for our Engineering Department. If you are planning any new improvements, whether for war or civilian packaging, call on us for suggestions.

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Over a Quarter Billion Packages per day are wrapped on our Machines

Meat Industry Considers Present-day Problems

Vital management and operating questions of industry geared to war are theme of meeting

How to deal more effectively with continuing wartime problems was the overall theme of the 38th annual meeting of American Meat Institute, October 5-7, in Chicago.

In his address, read by Wesley Hardenbergh, Chairman Schmidt reported that total meat production will be approximately 13 percent above that for 1942. He pointed out that our fighting allies could use our entire meat production if made available to them and that domestic civilian consumers could eat 5,000,000,000 lb. more than present consumption, if obtainable. There will be a grave shortage of meat, of beef particularly, by spring or before unless current meat production and marketing problems are quickly remedied.

The troublesome problems of the meat packers center around the labor shortage, government regulations pertaining to prices, feed supplies, finishing concentrates, processing equipment and supplies, and feeding facilities.

Discussing the labor problem, H. T. Jaeke, Oscar Mayer & Co., Inc., Madison, Wis., stressed the importance of: (1) Investigating and utilizing every possible source of labor, (2) keeping workers on the payroll, and (3) making most productive and effective use of people on the payroll.

These sources of labor were cited: (1) Other essential industries not making use of the worker's highest skill. (2) Nonessential industries. (3) Physically handicapped people, students, domestics and housewives. (4) Seasonal workers such as farmers and construction workers. (5) War prisoners. (6) Soldiers on furlough.

Inducements given to keep employees on payroll were: (1) Establishment of employee facilities such as lockers, eating places, canteens, first aid and medical care, announcement or bulletin board, credit unions, personal consultation and rationing instruction. (2) Setting up an induction program to aid new workers. (3) Interviewing discontents to learn cause of discontent and reason for wanting to quit. (4) Giving advice and aid for draft deferment.

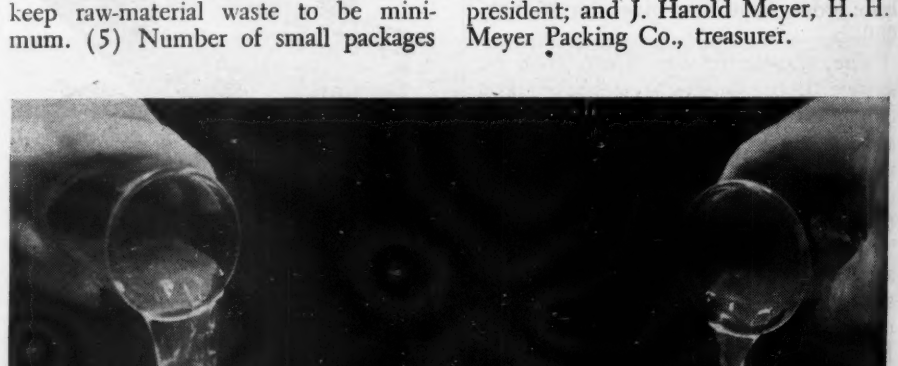
Aids in making effective use of employees were found in: (1) Training-within-industry courses for new workers. (2) Job-instruction training of a new employee for a particular job or of an old employee for a new job. (3) Job-methods training of an employee in the technic of analyzing and improving ways of doing a job. (4) Job-relation training for teaching the technic of handling grievances quickly and satisfactorily. (5) Reduction of absenteeism by regulating hours of shifts, through a good safety program, checking on absenteeism, and laying off or otherwise disciplining.

In his review of the labor situation, Brig. Gen. William C. Rose, chief of executive services, War Manpower Commission, summarized the requirements as of Jan. 1, 1944, to be: (1) An armed force of nearly 11,000,000. (2) An industrial army of about 18,500,000 to produce munitions and to service supporting activities. (3) An agriculture force of 9,000,000 with some 3,000,000 more for summer peak. (4) Maintenance of civilian economy.

In dealing with shortages of packaging supplies, W. E. Winans, Armour & Co., recommended that: (1) Container specifications be made flexible. (2) All specifications be set up to show preference and alternate. (3) Material specifications be reduced and sizes revised to require minimum of material. (4) Various sizes of containers be adjusted to keep raw-material waste to be minimum. (5) Number of small packages for shipping and trucking be reduced. (6) Containers of low weight capacity be eliminated. (7) Canned meat containers be uniform. (8) Overpack and display cartons be eliminated. (9) Inventories be controlled and purchase orders be extended. (10) Every container be investigated to see if other types can be substituted such as wire-bound boxes for slack barrels. (11) Reusable containers be adopted where possible so as to prolong container usefulness as much as 6 to 18 months. (12) Deliveries to customers be limited to make the most effective use of containers. (13) Container damage be prevented by adopting careful handling methods. (14) Reusable scrap be saved and be sent back to processors. (15) New sources of supplies of container materials be located.

Wesley Hardenbergh, president of the Institute, in his annual address to the Institute members, emphasized the potential effects of this wartime period upon the national economy of the future if present-day factors were improperly evaluated. He made a plea for planning to the end that, in solving present-day problems, the livestock and meat packing industries be prepared for conversion to postwar conditions.

Officers of the American Meat Institute for 1944, elected at the meeting, are T. Henry Foster, John Morrell & Co., chairman of the board; Samuel Slotkin, Hygrade Food Products Corp., vice-chairman; Wesley Hardenbergh, president; and J. Harold Meyer, H. H. Meyer Packing Co., treasurer.



NONGELLING STARCH FROM "WAXY MAIZE"

Illustration of the nongelling character of tapioca and Amioca starches as compared with cornstarch. Amioca is the National Starch Products' commercial name for the starch produced from waxy maize, this new starch being available for experimental purposes. This starch, as well as those from waxy or glutinous grains other than corn, differs from all other naturally occurring starches in that it possesses only one component, amylopectin. Other commercial starches also contain amylose. The characteristic properties of amylopectin are clarity, stability in solution, lack of tendency to gel and adhesiveness. The waxy maize starch has value as a substitute for tapioca and potato starch.

Apple Price Increase Upsets OPA Rollback

OPA's food-price program to roll back the cost of living index by 2.3 percent met its first serious challenge when economic stabilization director Fred M. Vinson issued a directive permitting ceiling prices for apples higher than those previously announced by OPA general manager Chester Bowles. Indications that citrus fruit growers might be able to force higher prices for oranges was another potential threat to the rollback program.

The first directive on apple prices outlined in the OPA program upset the apple cart by specifying a national average price of 8.75 cents per pound. Attempting to effectuate the 8.75-cent price, OPA ran into a storm of protest by apple growers and distributors who appealed to War Food Administrator Jones for a retail price of between 10 and 11 cents per pound. Apple interests gained their objective when the new OES directive raised ceiling prices approximately 1 cent per pound. Processors of apples were assured their just proportion of the scanty 1943 crop by FDO 83 which reserves about a fifth of the available supply for their use, guaranteeing 20,000,000 bu. of the lower grades of apples for processing.

Passes Bill To Change Name of Dry Skim Milk

DURING October the House of Representatives passed the bill urged by the American Dry Milk Institute fixing a new standard and definition for "nonfat dry milk solids." This legislation proposes to change the standard of identity fixed by the Food and Drug Administration by eliminating the requirement that this product be called dry "skim" milk.

Opponents of this legislation have urged that "skim" milk is really the name of the product after the butterfat has been removed as cream. They believe that the use of that term is necessary under the Food, Drug and Cosmetic Act, which requires labeling with the "common or usual name" of a commodity. The industry opposes that name on the ground that it attaches a stigma to a wholesome food.

The bill must now be considered by the Senate committee and later the Senate itself. It is expected that the dairy industry group backing the bill will exert pressure on senators for enactment comparable with the great pressure exerted in the House. The Food and Drug Administration is hoping that the bill will not be enacted, fearing that it will undermine the whole program of fixing standards for foods.

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LITERATURE ON REQUEST

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WFA Orders

Apple Crop—In order to divert about 20 percent of the 1943 apple crop into the manufacture of apple products, WFA on October 1 directed that lower grades of the fruit grown in eight major producing states be sold only to authorized processors. Action was taken through issuance of FDO 83, requiring authorized processors to pay not less than minimum prices which may be fixed from time to time by WFA. The apple products needed to fill essential war and civilian needs are canned apples, applesauce, applebutter, vinegar, cider, jelly, pomace, pectin, juice, apple chops, frozen, dried and dehydrated apples.

Flavorings, Extracts—Effective October 6, manufacturers of food and pharmaceutical flavorings, extracts and concentrates were no longer affected by the provisions of FDO 69 restricting the use of 25 varieties of fruits and berries in the manufacture of alcoholic products. Their exemption is contained in an amendment to the order made by WFA.

Sauerkraut—To facilitate military purchases, WFA on October 11 froze all stocks of sauerkraut in the hands of packers and required them to set aside all such stocks for government purchase. As soon as military requirements have been met, the set-aside regulations will be suspended and all remaining kraut supplies will be made available for civilian use, according to the terms of FDO 84.

Egg Storage—Storage restrictions and set-aside provisions on shell eggs were removed on October 7, since these provisions had served the purpose for which they were intended. The action was accomplished through revocation of FDO 40, originally designed to provide greater quantities of shell eggs for military and other governmental uses.

Cocoa Beans—WFA on October 6 raised the quota level for processors of cocoa beans as a means of increasing the flow of cocoa products for civilian, military and other essential wartime needs. The increased quota percentage was given effect by an amendment to FDO 25.1. A processor's grinding quota for the fourth quarter of 1943, and until further notice, is 80 percent of the amount ground in the corresponding quarter of 1941, instead of 70 percent.

Rice—In a move to conserve rice supplies for food purposes, WFA on October 8 provided that brewers may not use table quality rice in the production of beer and ale. The action, taken through an amendment to FDO 66, was necessary because there has been a trend toward increased use of rice in the brewing industry to compensate for the shortage of corn.

Tea—Current quotas for tea packers and wholesale receivers were increased by one-fourth in an amendment to FDO 18.3 issued October 1. The amendment increased quotas for tea packers and wholesale receivers from a quarterly quota of 60

percent to one of 75 percent, beginning October 1. Quotas are based on net deliveries during the corresponding quarterly period of 1941.

Animal Oils—Allocation of animal oils—lard, tallow and fleshing oils—was suspended on October 4 for a three months' period because of improved inventories. The amendment to FDO 53 frees animal oils from allocation, but limits the inventory of any manufacturer or distributor to 60,000 lb., or the aggregate of the two highest consecutive months of use between Jan. 1, 1943, and July 1, 1943, whichever is greater.

Turkey Embargo—FDO 71, put into effect August 2 to make it possible for the Army Quartermaster Corps to obtain at least 10,000,000 lb. of the first marketings of 1943 crop turkeys, was extended to give Army officials time to meet requirements. Government spokesmen predicted that if the full cooperation of processors was not obtained, purchase priorities would be issued to the Quartermaster Corps.

Soybeans—WFA late in September announced the issuance of an order covering restrictions on the purchase and use of soybeans. The order, CCC No. 6, is designed to promote the orderly marketing of soybeans by providing for proper allocations of soybeans for crushing and other uses, promoting production of soybean oil and oil meal and preventing the withholding of soybeans from market for speculative purposes.

Onions—Producers and shippers in the 12 states where onion shipments are controlled under a permit program are now allowed to move their onions into any type of storage within a radius of 25 miles without obtaining a permit, if they did so last year, under an amendment to FDO 77.

Edible Molasses—WFA recently announced an increase of 10 percent in the edible molasses and sirup quotas of blenders and food manufacturers during the marketing year ending Sept. 30, 1944. The upward revision in quotas through amendment 1 to FDO 51, has been made possible by increases in the production of cane sirup and Louisiana molasses.

Walnuts—Threats of a possible walnut shortage prompted government officials to issue FDO 82 on Sept. 30, restricting handling of the product. No person may now ship unshelled walnuts unless prior to the shipment he shall have set aside for government use a quantity of merchantable walnuts equal to at least 20 percent by weight of each shipment.

SCHEDULE OF EVENTS

NOVEMBER

3- 5—Grocery Manufacturers of America, wartime conference, Waldorf-Astoria Hotel, New York, N. Y.

4- 5—Packaging Institute, Inc., annual meeting, Hotel New Yorker, New York, N. Y.

DECEMBER

6-11—Nineteenth Exposition of Chemical Industries, Madison Square Garden, New York, N. Y.

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Lend-Lease Export Data Released

Food shipped to our Allies totals 9 percent of production in the United States

NINE PERCENT of the nation's total food supply was shipped abroad under Lend-Lease during the first eight months of 1943. One billion pounds of food and other agricultural commodities were delivered to shipside during August for export to Allied fighting fronts, according to a WFA report. The British Empire continued to receive the largest share of the deliveries, 69 percent. Russia received 23 percent; North Africa, 7 percent; and Greece, West Africa, The Netherlands and Turkey combined, 1 percent.

The effect of Lend-Lease on the nation's food supply during the first seven months of 1943 as compared with 1942 varies with different items. Shipments of milk have declined from 3.4 percent of the total supply in 1942 to 2.5 percent in the first seven months of 1943. Exports of cheese, which totaled 23.1 percent of the supply in 1942, have been 9.3 percent this year. Other groups have increased, although the volume exported continues to represent a relatively small proportion of the U. S. supply. Figures showing the relation between supply and Lend-Lease exports are given in the accompanying table.

Soya Flour for Bread Requires FDO Order

THERE WILL BE about one and one-half billion pounds of soya flour available during the coming 12 months. Means for disposal and efficient use of a few hundred million pounds of this supply are available. Government executives want to know what to do with the rest. They are worried.

One obvious outlet for the surplus soya flour is bread baking or the manufacture of other breadstuffs. Many bakers have indicated a willingness to make extensive use in this manner. These important bakers have been, however, confronted by a difference of

Lend-Lease Food Exports in Relation to Supply and to U. S. Civilian Population

	Exports Jan.-July 1943 (million lb.)	Exports in percent of supply		Exports — ounces per week per U. S. civilian	
		Year 1942	Jan.-July 1943*	Year 1942	Jan.-July 1943
All meats (dressed wt. basis)	1,167.8	5.8	8.3	3.3	4.9
Beef and veal	53.6	0.3	0.9	0.1	0.2
Lamb and mutton	78.3	0.4	13.6	0.01	0.3
Pork	1,035.9	11.3	13.5	3.2	4.3
All milk products (fluid milk equiv.)	1,761.4	3.4	2.5	10.5	7.4
Dry whole milk	6.5	6.1	8.4	0.01	0.03
Dry skim milk	143.1	23.0	38.0	0.3	0.6
Condensed and evap. milk	342.4	7.2	14.2	0.9	1.4
Butter	17.0	0.7	1.3	0.04	0.1
Cheese	60.1	23.1	9.3	0.8	0.3
Eggs, dried (shell egg equiv.)	473.6	10.0	10.4	1.7	2.0
Edible fats and oils	540.0	13.2	13.1	1.8	2.3
Canned fish	132.7	22.5	33.3	0.4	0.6
Fruits:					
Canned fruits and juices	62.9	1.7	2.4	0.2	0.3
Dried fruits	148.1	15.7	19.3	0.5	0.6
Vegetables:					
Canned vegetables	35.9	0.8	0.8	0.1	0.2
Dried beans	177.8	5.0	10.3	0.3	0.7
Dried peas	42.1	6.0	9.1	0.1	0.2
Corn and corn products (grain equiv.)	276.1	0.1	0.2	1.4	1.2
Wheat and wheat products (grain equiv.)	716.7	0.4	1.0	1.2	3.0

* Assumes the supply for the first seven months 1943 as 7/12 the total estimated supply for the entire year.

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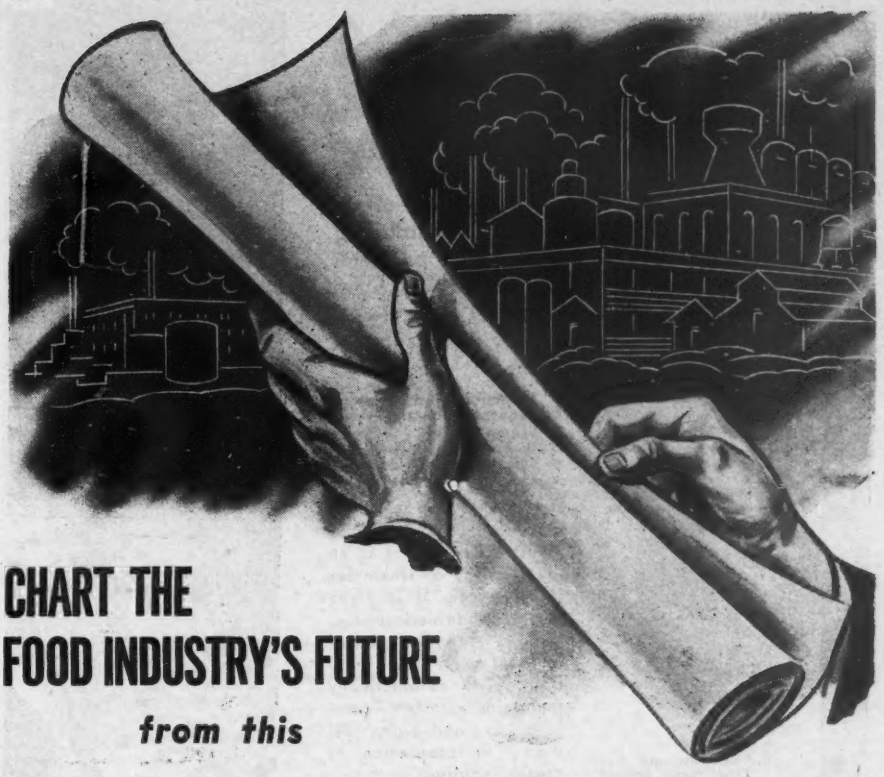
official opinion which has amounted to almost a barricade against progress. This appears to be the situation as of mid-October.

If a small amount of soya flour is added to ordinary bread, it probably does not much change the characteristics of the breadstuff. However, the proponents of soya flour made such a record in the bread standards hearings that they have almost disproved this conclusion. The record appears to prove that the protein of soya flour is so desirable dietetically that even small amounts added to white bread greatly improve the quality. That is an obvious distortion of the truth. The truth is that the protein of soya is a natural supplement to the protein of wheat; and the mixed proteins give a more desirable amino-acid mixture than can be obtained from either wheat or soy alone.

Originally, the Food and Drug Administration was willing to allow up to 3 percent of the flour to be soya flour, without changing the name or the label of the resulting "bread" or "white bread." But the hearing referred to was so distorted that under the law they have been compelled to issue a proposed standard which forbids adding any soya flour to an ordinary bread formula. This leaves the proponents of such flour without opportunity to promote their product unless they get a baker to add large quantities of soya flour so that he may call the end product a soya flour bread or a wheat and soya flour bread. To qualify for such designation there must be added "a sufficient quantity of soya flour to make the product significantly different than ordinary bread and of such new properties as to warrant the new name." This is approximately the policy which the Food and Drug Administration believes must be followed under the mandate of the law.

The Food Distribution Administration, a part of the War Food Administration, can issue a war bread order requiring bakers to use soya flour in all bread. Such an order would be precisely like the one which requires that all commercially baked bread contain minimum quantities of vitamins and mineral nutrients. Apparently FDA must do this, or the huge surplus of soya flour will not be used. F&DA appears quite willing that FDA do so. Certainly, there is nothing evident to indicate a desire on the part of Food and Drug in any way to interfere with such plan. Whether the FDA will act remained undetermined in mid-October.

Since the matter remained unsettled, it had not yet been determined whether Food and Drug would act with a final definition for white bread excluding all soya flour, if Food Distribution declined to carry on its plan to include that component.



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from this

STARTLING PREVIEW

To be among the first to see a startling new chart of industry —visit the 19th Exposition of Chemical Industries at New York's Madison Square Garden, December 6-11.

As a summary of current achievements in chemistry and engineering and a preview of the future, this Exposition deserves the attention of every chemist, production man, engineer and executive in the food and processing industries. From what you can see . . . from what you can hear when you talk with the technical experts in attendance at exhibits . . . may come the answers to many otherwise baffling problems. It's the right place to seek the "know-how" you need to carry on in these days of food in new forms, allocations, Government restrictions, food rationing and other necessary wartime handicaps.

Marvels in the production of new substances by chemical methods with their counterpart in special processing equipment are still necessarily in part a war secret. Many details that may be revealed however, including not a few bearing on post-war plans will form a leading interest at this year's Exposition of Chemical Industries.

Important decisions regarding the post-war activities of manufacturers may be made as a result of this Exposition. Much of the information to be disclosed reflects either the creation of new industries and their products, or the conversion of existing plants to new use—to help win the war now, to help rebuild the world after Victory has been won.

To be among the first to see the startling new chart of industry, visit this year's Chemical Exposition—and bring your associates.

19th EXPOSITION OF CHEMICAL INDUSTRIES
MADISON SQUARE GARDEN • NEW YORK • DEC. 6-11, 1943
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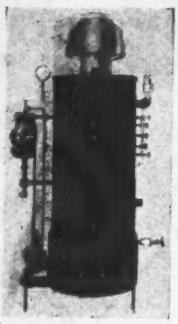
4683

• STEAM for the War Plant CAFETERIA

From long before the hungry workers pour into the dining room . . . until long after they're gone — *steam* performs many important jobs in the war plant cafeteria. The steam boiler must always be ready to supply plenty of clean, constant-pressure steam for—

- Steamjacketed kettles
- Vegetable steamers
- Steam tables
- Dish washing machines
- Sterilizing of utensils, etc.



KANE Automatic Gas-Fired Steam Boiler

The KANE Automatic Gas-Fired Steam Boiler (illustrated at left) is an ideal source of steam for this purpose. It is clean and dependable in operation . . . can be placed in any convenient location . . . automatically maintains constant pressure . . . and burns fuel only in proportion to steam required.

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Manufacturers of Automatic Steam Boilers for over a third of a century

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EXHAUST FANS for SCIENTIFIC VENTILATION

While WPB Regulations do not permit us to accumulate a warehouse stock of Coolair Fans, our plant has been able, up to now, to make reasonably prompt shipment on all priority rated orders, but . . .

Because this favorable situation may not prevail at the time you plan to install Coolair Fans in your plant we suggest that you figure out the number of fans you will need to solve your ventilating and cooling problems and place orders now while the necessary materials and supplies are still available for manufacture.

CATALOG PAGES
Fan models, dimensions and performance data can be found
in SWEET'S ASHVE GUIDE and ELECTRICAL BUYER'S REFERENCE

Should CMP Regulation 5 not cover your requirements, file form PD-1A with your nearest WPB Field Office. All orders must bear a priority rating of AA-5 or better.

AMERICAN COOLAIR CORPORATION

"Pioneer Manufacturers of V-Belt Drive Exhaust Fans"

3604 Mayflower Street **Jacksonville 3, Florida**

WPB Orders

Packing Grapes—Restrictions on the packing of three varieties of grapes in wooden shipping containers were lifted on October 5 in revisions of M-241-a. Formerly these three varieties—Black Prince, Gros Colman and Ribier—were among the commodities shipment of which in wooden shipping containers was restricted to 50 percent of the 1942 packing quota. The change will place these three varieties in the same category as the table varieties and permit the packing of 110 percent of the 1942 pack.

Ethyl Alcohol—Ethyl alcohol, tax paid and withdrawn for beverage purposes, can be imported into the United States from Puerto Rico, according to WPB's announcement on October 4. This was effected through an amendment to M-30, which regulates the distribution of ethyl alcohol and related compounds. Since M-54 permits the use of molasses outside the continental United States for manufacture of beverage alcohol, it was decided last July to remove from the control of M-30 all transactions in ethyl alcohol outside of the United States. The amendment to M-30 permits export to continental United States.

Glass Containers—To provide adequate glass containers for the food pack, restrictions on the delivery and use of glass containers will be continued under L-103-b until the end of the year. The first amendment to the order, issued September 20, redefined the type of glass containers now permitted. The September 24th issue of the *Federal Register*, page 12981, diagrams the containers that may be used for a variety of food products, including jars for vegetables and fruit, juice, olives, cherries, shortening, chili sauce and catsup. The September 25th issue of the *Federal Register* carried diagrams for permitted containers for wine.

Wooden Shipping Containers—On October 6 new schedules were appended to the wooden shipping container limitation order, listing specifications for packing many types of food products. Specifications for berries, fruits and vegetable containers and shipping boxes for chickens and turkeys were listed in the revised orders, which also restricted the use of wooden containers for shipping different varieties of juice grapes. The new schedules are given in the *Federal Register* of October 6, page 13674.

Pulp and Paper—An amendment to M-241-a, issued October 5, included new restrictions on the use of fiber shipping containers, cans, drums, tubs, barrels, dividers, partitions and separaters; cups, pails and nested food containers; grocery bags and specialty bags. No converter may, during the final calendar quarter of 1943 or thereafter, manufacture or assemble any converted product not listed in the official lists and schedules of the order.

Tapioca Flour—The use of tapioca dextrine and other modifications of tapioca flour was brought under control of WPB in revised M-333 issued in September. The revision extends the original prerogative of the order by adding to materials under con-

trol tapioca dextrine and any modification of tapioca flour made through mixture with other chemicals, starches or flours, or through modification of the starch itself by hydrolization or chemical reaction.

Refrigerating, Air Conditioning—Steps were taken recently by WPB to facilitate more prompt emergency maintenance and repair service for essential industrial and commercial refrigerating and air conditioning systems. P-126, as amended, simplifies the procedure for obtaining repair parts and materials, and also removes provisions limiting the use of preference ratings to service agencies holding certificates of authority and serial numbers issued by WPB.

Burlap Bags—A recent WPB action removed users' quota restrictions on the purchase of new burlap bags for packing all agricultural products—except fertilizer, sugar and tankage—for the remainder of 1943. The action was taken through an amendment to M-221, which in the past has restricted purchases of such bags to specified percentages of 1941 purchases.

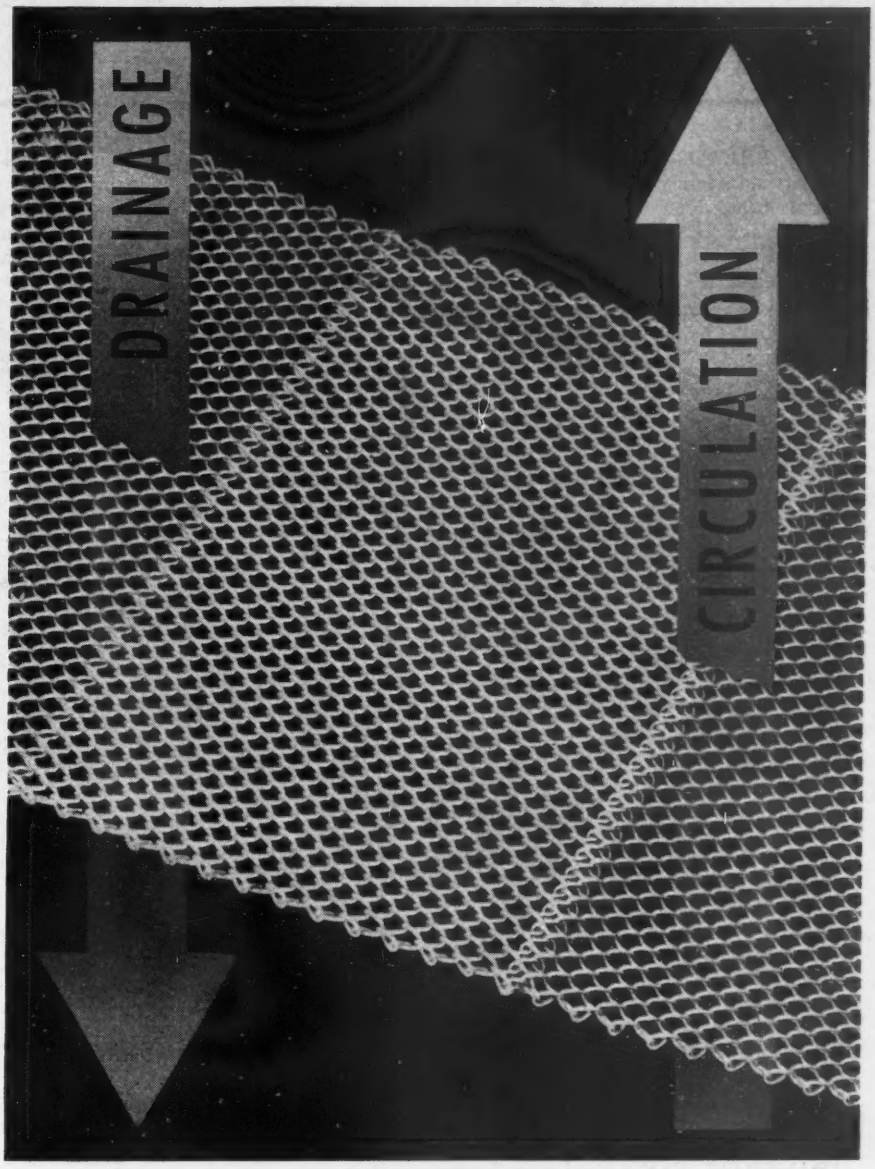
General Mills Enters Soya Processing Field

GENERAL MILLS is entering the soybean processing field. On October 19 the company announced that it had purchased the properties of American Crystal Sugar Co., Belmond, Iowa, and will convert them into a soybean processing plant. The immediate reason for this move is the wartime need for added soybean producing capacity to meet the protein and oil shortages. But it is felt that the multitudinous peacetime possibilities of soybean oil and meals furnish many potential opportunities for production and employment after the war, according to Harry A. Bullis, president of the company.

The operations will be under the direction of Whitney H. Eastman, who recently was appointed president of the new vegetable oil and protein division of General Mills.

QMC Specifications Issued

A RECORD-BREAKING number of tentative specifications for foods were issued during September and October by the Quartermaster Corps operating from the Chicago depot, with specifications for various types of meat products leading the field. Among the products for which specifications were recently issued are boneless frozen beef, canned beef and gravy, canned sliced bacon, canned pork and gravy, canned swiss steak and gravy, canned corned beef hash; dehydrated cabbage, dehydrated carrots; synthetic lemon juice powder, natural and imitation beverage bases; army Air Forces lunch flight ration, special hospital ration and the "K" ration.



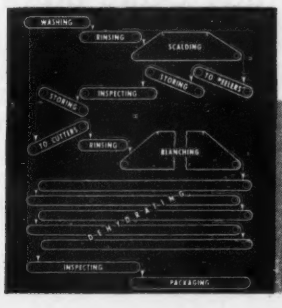
The "Why's" of Dehydrating, Blanching and Processing on Metalwove Belts

There are no "dead spots" on an Audubon Metalwove Belt to retard the circulation of heated air in a dehydrator or the penetration of steam in a blancher. The woven wire fabric which conveys the vegetables is supplied in the correct weave, with wire of the proper diameter to safely carry the load and to prevent the vegetables from "falling through."

Washing And Peeling

The characteristics of Metalwove Belts which provide for the circulation of heated air or steam also provide for complete drainage of conveyed vegetables in washers, removing vegetables from underwater storage and lye peelers. . . . From raw vegetables to the finished product, these belts can be arranged for gravity "self loading," thus, aside from their other advantages, they can introduce tremendous labor savings. Production becomes a smooth, synchronized flow.... Our engineers will gladly assist you in selecting the correct Audubon Belt for the various operations in your plant.

AUDUBON CONTINUOUS DEHYDRATING SYSTEM



AUDUBON
WIRE CLOTH CORPORATION
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CAPITAL VIEWS

STALE BREAD—Washington really meant what it said when it forbade bakers to pick up stale bread. One company in the Capital did not take the order seriously. Now it is under suspended sentence as a penalty. If it offends again it will be shut summarily for a period of 15 days. Other bakers should take notice and make certain that their driver salesmen are careful too.

INCENTIVE PLANS—Food manufacturers may later find themselves under pressure to adopt wage-incentive plans to speed up output. Study of these projects as used in war equipment factories is very desirable. The important thing is that any plan adopted must increase output with the present number of employees. The purpose is not to give higher wages. The objective is to get larger output with limited manpower and without the inflationary effect of higher wage cost per unit of product.

VITAMINS ABUNDANT—The supply of synthetic vitamins is now ample for all the flour and bread enrichment that is required in the interest of better diet conditions for the country. However, bakers are being warned that their products may become a "possible dumping ground" for a variety of materials which are not really required. Washington is pleased that such a warning has been given to the baking industry at its recent New York conference. Even those most zealous in urging vitamins for enrichment are anxious that an intelligent use of these essential nutrients should be planned. Extremists with only a sales motive can well be questioned by all food manufacturers when they ask for extravagant enrichment of foods.

TRANSPORT TAX—Food manufacturers should not pay a double tax under the new Federal requirement of 3 percent tax charged on goods movement by motor carriers. Such tax must be paid once; but the settlement between motor carriers adjusting the differences in amount of service rendered to a pool is not subject to such tax. Where food companies are served by pool delivery or transport systems, they can well check up to be sure that they are not paying the required tax twice.

CARE IN PACKAGING—With the growing shortage of labor to supply pulpwood and paper, there is increased need for care by every food manufacturer. Extremes of economy in the use of all packaging materials are necessary. Wherever possible, reuse of cartons and heavy containers is urged. Anything which will save on these commodities, which are big pulp consumers, will help greatly and may prevent delivery difficulties that loom in many quarters.

MILK SHARING—The New England plan for the sharing of so-called "surplus milk" is complimented heartily by the Department of Agriculture in Washington. There is increasing evidence that milk will continue to be more and more scarce, especially in regions congested by war activity. A community in which scarcity is noted will be expected to develop a sharing plan for equitable distribution of limited milk supplies among dealers. It is not too soon to study out ways and means before the shortage arises.

MILK CONTROLS—Milk shortage is also going to compel radical restriction on cream sales and cream-products manufacture. This will restrict the available supplies of skimmed milk and hence the quantity of cottage cheese. Washington intends to stretch the limited milk supplies by rigid controls in order to make the maximum amount of fluid milk available for essential home, institutional and industry uses. This may result in further restriction of milk for bread and for other types of food products. Already the makers of ice cream know what it means for them. A long-range plan is advisable at every milk-using establishment. A carefully prepared plan of action, if milk supply is cut off, is not likely to make the cut come any sooner; but it will make it much less painful and costly when it does come.

FOOD RUMORS—Washington is really serious in its promise that coffee rationing will not be resumed. It is evident that millions of folks have been worried about this point since they discovered coffee coupons in their ration books. Actually, those coupons are going to be used for some other foodstuff. And incidentally, some of the coupons showing point values will be used without regard to those denomination labels. It is clear that rationing of food is going to continue, even after the shooting war ends. But there are a few things like coffee that seem to have escaped permanently from restriction.

BLOC BATTLES—Food-price controversies in Washington have become battles between blocs. The agricultural group and the labor group are constantly at odds. Politicians naturally pose as spokesmen of the consumers' bloc, because that includes everybody. When estimating the prospect for food prices, each food executive must weigh the influence which he believes can be exerted by each of the blocs working as a pressure group as it seeks advantage in legislation or through administrative decision. Unfortunately, there is no effective food manufacturers' bloc.

"A" AWARD FOR FOOD INDUSTRY

Like the Army-Navy "E" awards for excellence in industrial production, "A" award flags will be passed out by the War Food Administration to qualified rural counties or to individual food processors who make outstanding production records. The flag shows a blue "A", surrounded by a white wreath consisting of a head of grain and half a gear wheel, symbolic of farm and food plant production, all on a green field symbolic of agriculture. A white star (upper left corner) indicates the first season's award.

Use Microphotographs To Study Cake Baking

How microphotography may be used to study changes in foods during processing was demonstrated to the Midwest Section of the American Association of Cereal Chemists, at Chicago, by George T. Carlin, research bakery chemist of Swift & Co., on the evening of October 4.

Both natural color slides and moving pictures of what takes place in cake batter during baking were shown. Pound cake with high fat content and white layer cake with low fat content were the subjects of the microphotography study.

In each instance the stage of the microscope was fitted with an electrical heating unit to simulate bake-oven effects upon the batters on the microscope slide, and the still and movie cameras were attached to the eyepiece end of the microscope so that actual photographs could be taken of the batter on the slide as the baking progressed.

The photos showed that the dispersion of the fat throughout the batter is in lakes and that the air bubbles incorporated during creaming are always in the fat lakes, although emulsifying agents make smaller fat lakes by increasing their number. They also showed that, when the fat is too finely dispersed by use of emulsifying agents, a deleterious effect is produced in the cake, and that lard disperses more readily in cake batter than does hydrogenated shortening.

The effect of chemical leavens in cake batters was shown to be of secondary value to that of air incorporated during creaming. In the absence of leavening agent gas, the air bubbles were seen to leave the fat lakes during baking and enter the solution of the water-soluble ingredients. In the presence of leavening agents, this move-

ment of air bubbles was the same except that the gas from the baking powder first mixed with the creamed-in air bubbles in the fat lakes.

The technic of making the microphotographs was given as requiring patience and perseverance more than photographic experience and skill.

Egg Dryers Establish Research Program

STEPS to establish spray-dried eggs as a domestic market staple will be implemented by a research program recently set up by the National Egg Products Association in Chicago.

Established as a cooperative activity between the egg industry and governmental agencies, the program involves a fundamental study of the chemistry of eggs. Increased uniformity in quality and improved stability during storage and marketing to give high palatability are the objectives of the program.

Participating in the program are the research laboratories of egg drying companies, state agricultural colleges, U. S. Department of Agriculture experiment stations and the Regional Research Laboratories. George F. Stewart, associate professor of the Poultry Products Department of Iowa State College, has been made coordinator for the program.

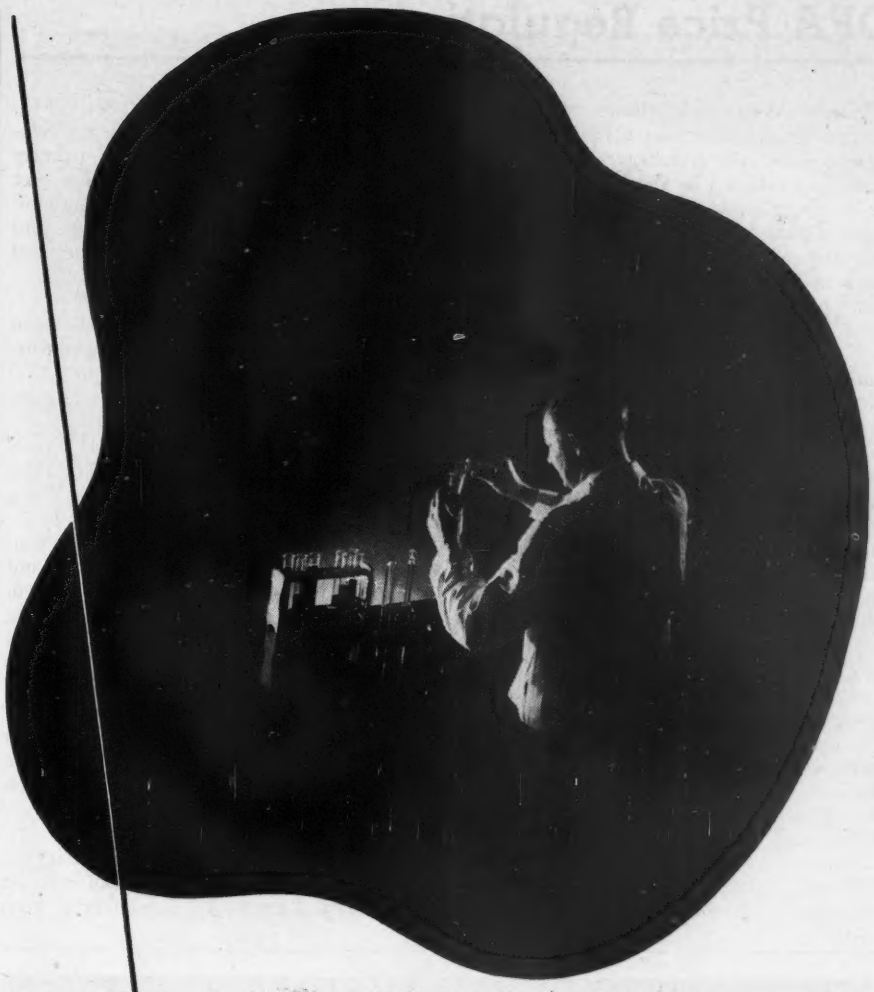
Funds to support this research are being supplied by the egg drying industry on the basis of 1943 production. While the program has been launched in anticipation of postwar marketing of dried eggs, findings will be put into practice for wartime production as rapidly as they are determined.

Labor, Paper Shortages Disrupt Candy Trade

ACCORDING TO National Confectioners Association, the 10 percent increase in the allotment of cocoa to the candy industry, raising the base to 80 percent of 1941 consumption, will not benefit the confectionery industry very much at this time. Although the candy makers are in a fair position currently as regards supplies of cocoa and sugar, the acute labor shortage and paper carton scarcity will tend to prevent the makers from taking full advantage of the more favorable raw materials supply.

In this connection the NCA reported that the industry is launching a campaign to reclaim corrugated and other heavy board shipping containers from the retailers.

NCA also reports that the peanut quota (100 percent of 1942 consumption) will hit the industry because a large number of the confectioners have increased production of peanut candy greatly in the past 12 months.



The man in control... Few products are manufactured under such close, scientific controls as fine chemicals — yet even here the human element is important.

That's why *every* batch of *every* Monsanto food flavoring chemicals is *double* checked in the control laboratory before a single pound leaves for your plant. And that's why *every* Monsanto control chemist is carefully trained in the latest analytical techniques.

The skill and knowledge of these men are your guarantee of *controlled* quality in *every* shipment you receive from Monsanto. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, St. Louis, Mo.
District Offices: New York, Chicago, Boston, Detroit, Charlotte, Birmingham, Los Angeles, San Francisco, Montreal, Toronto.

MONSANTO CHEMICALS

Monsanto Flavoring Chemicals of *Controlled* Quality
Vanillin Monsanto — Methyl Salicylate Monsanto
Ethavan (Ethyl vanillin) — Coumarin Monsanto

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OPA Price Regulations

California Wines – Maximum prices for processor's sales of current California wines, both in bulk and in packages, were established on October 1 by OPA at levels which are at going prices, but under conditions which should mean somewhat of a decrease at retail. The maximums, expressed in terms of cents per gallon, and dollars and cents per case, were contained in amendment 3 to MPR 445.

Poultry Parts—Drawn poultry items must be sold and delivered to retailers in whole carcass, split carcass or quarter carcass form only, if they are to command maximum base prices established for those items. The change, embodied in an amendment to RMPR 269, released on October 6, also ruled that drawn poultry must be sold and delivered to retailers within a 50-mile radius of the point of slaughter in order for the drawn poultry prices to be charged.

Live Hogs—A detailed schedule of maximum commissions which dealers in live hogs can charge was inserted in MPR 469 on October 5. This schedule, contained in amendment 1 to the order, ranges from $2 per truck of 3,000 lb. or less to $10 per single-deck railroad car and $15 per double-deck railroad car.

Potatoes—Ceilings designed to hold the average price of potatoes between 4.5 cents and 5.5 cents per pound from October, 1943, through June, 1944, were fixed on September 29. Maximum prices for country shippers and intermediate sellers were set on a sliding scale by months to absorb increased storage charges. Prices in Maine and Idaho potato areas range from $2.15 per 100 lb. in October to $2.75 in June.

Carrots—Regional offices of OPA have been instructed to set maximum prices on carrots, in sales prior to retail, on a basis of $3.50 for crates of six dozen bunches. f.o.b. Salinas, Calif. The action, taken on September 29 through an amendment to MPR 370, priced packs other than the six dozen on the basis of normal differentials.

Jams and Jellies—Bringing its regulation controlling prices of fruit preserves, jams and jellies into line with the recently issued ceilings on grapes, OPA on October 9 listed the figures which packers may use for fresh Concord grapes in determining the permitted increase for raw material costs which they may add to their previous ceiling prices. The action, amendment 1 to MPR 473, is a formula regulation, with the cost of the fruit or vegetable one item in the computation.

Apples—In one of the first steps in its announced program to extend control over the prices of fresh fruits and vegetables to keep down the cost of living, OPA on October 6 established maximum prices for apples for home consumption at levels which will mean a season's national retail average of between 10 and 11 cents per pound. The retail maximum for the month of October averaged about 9½ cents per pound. The action, amendment 9 to MPR 426, was based on a recent directive from the Office of Economic Stabilization.

Dried Fruits—Maximum prices which processors and primary distributors can charge for dried apricots, peaches, pears, prunes, raisins and figs of the 1943 crop were established on October 4 by OPA at levels which, reflecting increased costs of raw fruits and labor, were substantially above those of 1942. The increases given in MPR 475 are said not to affect the cost of living except in the case of figs, a relatively minor item in the dried fruit field, and a few speciality items.

Milk—Limited conditions under which the National and Regional offices of the OPA can raise milk ceilings in cases of local shortages were announced on October 6 in amendment 59 to GMPR and in minor revisions of several other price orders. The action authorized price adjustments by the Regional offices in event of local shortages only where local price maladjustments threaten small, low-priced communities, having populations of less than 25,000, with serious deficiencies in their milk supply.

Fruit Cocktail—Canners' maximum prices for fruit cocktail were revised to reflect the

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Metso Cleaners have answered the urgent call for "help wanted". They assume major responsibility for your clean-up. Metso cuts through stubborn grease films, suspends removed dirt and floats it all away in the rinse.
And remember too, Metso has a safety quality, silica content. This protects sensitive surfaces and therefore prolongs the life of your irreplaceable equipment.
Metso helps "green" hands do a better clean-up job. Ask for further information.
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Don't waste manpower, containers, materials or shipping space with obsolete packing methods. Let VIBROX PACKERS do the job! They'll pack containers from 5 lbs. to 750 lbs., quickly, efficiently, quietly,—saving enough to pay for themselves within a few months! Send us a sample of your product. We'll VIBROX-test it and return with our recommendations. The number of VIBROX Packers now in use testify to the economy and efficiency of this finely-built machine.
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ENGINEERS AND MANUFACTURERS SINCE 1872

increased costs of certain ingredients of the product, and maximum prices were established for sales of cocktail cherries to be used in fruit cocktail in amendment 17 to MPR 306, effective on October 9.

Variety Meats—Brokers in variety meats and edible byproducts can charge buyers 12½ cents a hundredweight for services rendered in connection with sales, and sellers who pack these commodities in returnable shipping containers can add 25 cents a hundredweight to established maximum prices. The authorization was given in an amendment to MPR 398, issued on September 28.

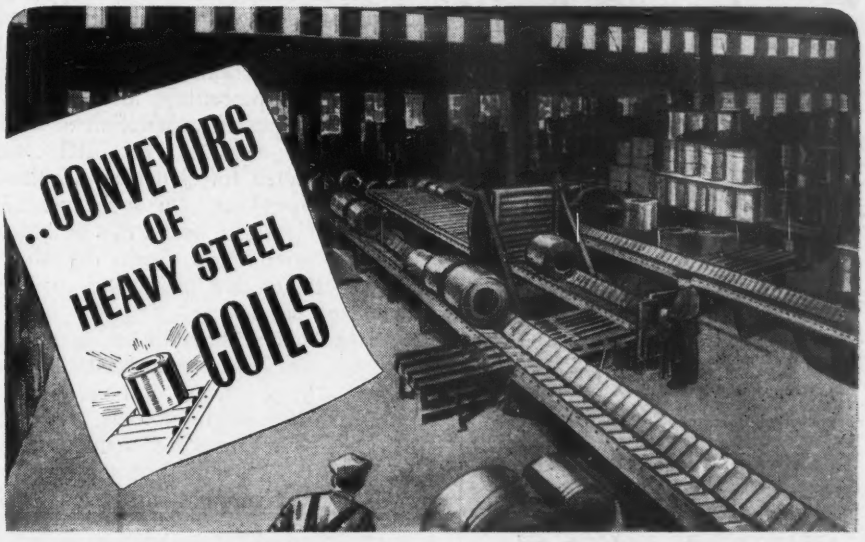
Peanut, Soybean Oils—Pending action on requests from the industry for an adjustment in the maximum prices for refined peanut oils and soybean oils, OPA on October 12 issued an order permitting refiners to sell at prices that may be adjusted to the new maximum prices when and if they are put into effect. Order 22 under MPR 53 was given to promote distribution and production of refined peanut and soybean oils.

Ice Cream—Present maximum prices for ice cream and ice cream mix will remain in effect for 60 days after Sept. 23, according to an amendment to Supplementary Regulation 14A to GMPR. This represents the fourth extension of temporary price provisions first issued on Feb. 22, 1943.

Grapes—Virtually completing its pricing of grapes designed for sale for home consumption, OPA on September 21 established maximum prices for Concord grapes and for California juice grapes at levels representing a substantial reduction under going prices. The action was taken through amendment 8 to MPR 426.

CHESTER BOWLES

Following Prentiss Brown's resignation as OPA Administrator, President Roosevelt nominated Chester Bowles, OPA general manager and former advertising executive, as his successor, with Senate confirmation momentarily expected.



Standard Conveyor Engineers Have the Engineering Skill and Manufacturing Facilities to Build For a Variety of Needs

One of the largest and most notable pneumatic tube systems ever built — serving 27 departments at Bell Aircraft with swift transmission of important papers — is an outstanding example of Standard Conveyor engineering and manufacturing ability.

A complete roller conveyor system for the handling of heavy sheet-steel coils, weighing several tons each, in a large eastern mill is another noteworthy Standard Conveyor installation.

These highly diverse examples are indicative of Standard Conveyor engineering versatility and manufacturing skill. An experience record of more than 35 years, serving all classes of industry and business, qualifies Standard Conveyor to be of service to your company — on any conveyor requirement, large or small, for immediate or future handling needs.

Write for valuable reference book—"Conveyors by Standard" — Catalog No. AM-11.

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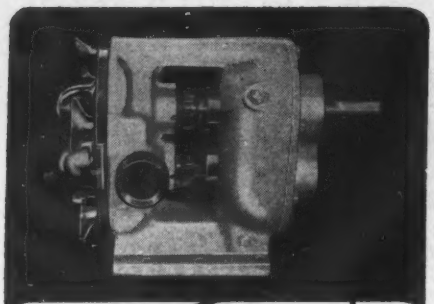
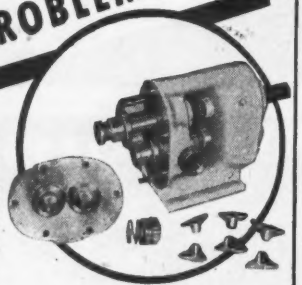
★ ENGINEERED FOR FASTER PRODUCTION ★



SOLVE YOUR Wartime Food Processing PUMP PROBLEMS—



BUMP Pumps are 100% sanitary.— Note few parts to be cleaned—and how easily dismembled for cleaning.

Food processing plants that have BUMP Pumps know what uninterrupted production means during these critical times. BUMP Pumps are positive displacement type pumps that operate at slow speeds, are self-priming under high vacuums or against head pressures, and deliver a constant volume per revolution without churning action or agitation within the pump. Thin, viscous, hot or cold liquids, or solid bearing liquids can be successfully pumped. Note the principle of operation below, and then ask us how BUMP Pumps can help your production, especially if needed for the armed forces.

PRINCIPLE OF OPERATION

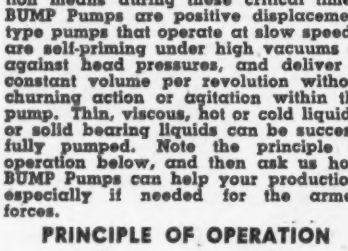


FIG. 1 FIG. 2

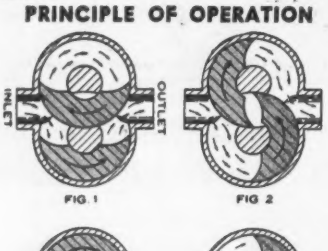


FIG. 3 FIG. 4

CAPACITIES *from* ONE *to* 300 GALLONS *per* MINUTE!

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The BUMP PUMP CO.
LA CROSSE ★ WISCONSIN

WFA Requests Record Crops

Food program for 1944 surpasses all former goals; 380,000,000 acres to be planted

FARM PRODUCTION goals for 1944 soar above the record output of food expected this year, utilizing 380,000,000 acres of crop land, the largest ever planted. With military and foreign relief demands for foods increasing, WFA has set goals that should provide the greatest harvest in history.

Some of the direct food consumption crops—dry beans, peas, soybeans, peanuts, wheat, vegetables and potatoes—will get first claim on use of crop land, taking precedence over feed crops and calling for reduction in some types of live-stock production. The goals provide the following percentage increases over this year's expected production or acreage: milk, 3; eggs, 1; beef cattle and calves marketed for slaughter, 19; hay, 3; corn, 3; wheat, 26; soybeans, 22; peanuts, 31; sugar beets, 42; potatoes, 2; sweet potatoes, 8; fresh vegetables, 10; vegetables for processing, 6; dry beans and peas, 18.

Percentage decreases were suggested for farm chickens, commercial broilers, turkeys, hogs, sheep and lambs on farms, barley, sorghum, oats, rye and flaxseed. The proposed reduction in livestock types would not show up in civilian meat supplies until late 1944.

175 Exhibits Planned For Chemical Show

THERE will be at least 175 exhibits of processing equipment, materials and supplies at the 19th Exposition of the Chemical Industries, to be held in Madison Square Garden, New York, December 6 to 11. And all of these will be conveniently located on one floor.

The interchange of ideas fostered by this exposition should be of practical help to men in the food processing industries, especially as a large number of the machines, materials and supplies shown will have direct application in food plants.

Chicago Food Industry Starts Paper Salvage

CHICAGO food manufacturers have taken the lead in the food industry in drafting a program of conserving fiberboard and corrugated cardboard containers. The program consists of two alternates: Salvaging the containers and shipping them back for reuse, or shipping them back for waste paper.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded October (thousands)	Total Awarded 1943 (thousands)
Bakery	.....	$40	$40
Beverages	.....	.....	.....
Canning and Preserving	$130	.....	235
Cold Storage	162	40	540
Confectionery	.....	.....	40
Grain Mill Products	230	50	2,027
Ice Manufactured	.....	.....	40
Meats and Meat-Products	356	200	485
Milk Products	200	40	1,002
Miscellaneous	200	540	3,526
	$1,278	$910	$7,935

Since Chicago food manufacturers mostly fall within the AA-3 priority classification, following the Army, Navy and Lend-Lease, they anticipate little difficulty in obtaining the required number of containers, but the new salvage program will assure a steady supply.

Increased Fat Supply No Aid to Industry

SUPPLIES of fats and oils from domestic materials are expected to increase by 5 or 6 percent in the 1943–1944 production year. Also, imports of these products are expected to increase. As a result, total available fats and oils supplies will be greater than ever before.

Nevertheless, supplies available for American consumers will be no more than in the preceding year, and maybe less, and the United States is expected to export more than it imports of these materials for the first time since 1924. The needs of our Allies and of countries released from Axis control account for this continuing tight situation in fats and oils supply.

Vegetable Protein Use Likely to Increase

ALTHOUGH the War Food Administration has set its 1944 meat goals high, and expects to get 2,000,000,000 lb. more meat next year than this, the outlook for civilians is for no more and probably for less meat. This is because allocations of meat next year to other than civilian uses have been increased 25 percent over the 1943 quantity.

When this situation is viewed together with the WFA goals for increased vegetable protein output, it is evident that civilians are expected to piece out their meager meat rations with these vegetable foods. Plans call for the already record breaking peanut crop to be increased 32 percent, while soybeans raised for beans are to be increased 16 percent.

It is obvious from these facts that

food processors will be faced with the necessity for making palatable foods from greatly increased quantities of these protein-bearing vegetables. Considering the capacity available for such processing at the present time, it is evident that major increases in processing facilities are called for.

Crop Prospects Improve Slightly

WHEN the Crop Reporting Board released its October report on October 10th, somewhat improved prospects were indicated for a number of important crops, while a few crops showed a falling off when compared to the September report.

Corn prospects continued to improve, with an increase recorded of 70,000,000 bu. to 3,055,605,000 bu. Wheat also increased, though only slightly, to 835,816,000 bu., while oats went up 3,000,000 bu. to 1,148,692,000 bu. Other crops to show small increases for the month were potatoes, sweet potatoes and hay.

The crop to show the most extensive falling off in prospects was flaxseed, down in a month from 54,720,000 bu. to 51,486,000 bu. Small decreases were also indicated for rice, barley and grain sorghums.

In general, indications are that 1943 crops will reach the second largest total on record, second only to last year's output. As the meat supply is greater this year than in 1942, total food supplies for 1943 are expected to be the largest ever recorded.

INDICATORS

Flour production in September, 1943, by mills accounting for 73 percent of U. S. output, was 14,277,600 sacks according to The Northwestern Miller, compared to 13,698,814 sacks in August, 1943.

Confectionery and competitive chocolate products were sold in August, 1943, by 211 firms reporting to the Department of Commerce, to the amount of $31,381,000. This was a 12 percent increase over sales for August, 1942. For the first eight months of 1943 sales were $255,386,000 for 203 firms, an increase of 22 percent over sales in the corresponding 1942 period.

Cocoa imported into the United States in 1943, up to the middle of October, totaled 3,314,445 bags, compared to 989,741 bags during the corresponding 1942 period.

Fish, frozen, in storage on September 1, 1943, totaled 92,476,000 lb., compared to 109,428,000 lb. on September 1, 1942, and to a five-year average of 84,355,00 lb. for the date.

Cherries, red sour, canned in 1943 totaled 561,778 cases, all sizes, compared to 3,061,809 cases in 1942 and 2,064,475 cases in 1941.

Salmon canned in Alaska this year, up to September 18th, totaled 5,327,620 cases, compared to 4,973,020 cases packed during the corresponding 1942 period.

Sardines canned in California, up to September 25th of this year, totaled 712,454 cases.

Oleomargarine sales in August, 1943, as indicated by sales of internal revenue stamps, totaled 37,834,425 lb., 80.3 percent above sales in August, 1942. Sales of this product for the first eight months of 1943 were 307,113,429 lb., an increase of 45.6 percent over sales in the corresponding period of last year.

Eggs, dried, produced in August, 1943, totaled 16,050,000 lb., compared to production of 22,541,000 lb. in August of last year, a reduction of 29 percent.

Liquid eggs produced in egg breaking and drying plants, for all purposes, in August, 1943, totaled 68,800,000 lb., compared to 81,793,000 lb. in August, 1942.

Butter, creamery, produced in August, 1943, totaled 151,880,000 lb., compared to 181,335,000 lb. produced in August a year earlier.

Butter, creamery, produced in the first eight months of 1943 totaled 1,261,080,000 lb. The figure for the corresponding period of 1942 was 1,271,943,000 pounds.

Cheese, American, produced in August, 1943, totaled 77,185,000 lb., compared to 85,644,000 lb. in August, 1942.

Cheese, American, produced in the first eight months of 1943 totaled 567,950,000 lb., compared to 713,031,000 lb. produced in the same months of 1942.

Evaporated milk produced in August, 1943, totaled 275,500,000 lb., compared to 270,024,000 lb. in August of the preceding year. The total production for the January-August period of 1943 was 2,329,290,000 lb. a decrease of 15 percent below production in the same months of 1942.

Condensed milk, all kinds, produced in August of this year totaled 82,187,000 lb., compared to 81,793,000 lb. produced in August, 1942.

Milk, dried whole, produced in August, 1943, totaled 9,125,000 lb., compared to 5,558,000 lb. produced in August, 1942. For the first eight months of 1943, production was 94,775,000 lb., 146 percent over production in the corresponding months of the preceding year.

Milk, dried skim, produced in August, 1943, totaled 44,100,000 lb., 24 percent below the 58,273,000 lb. produced in August, 1942. For the January-August period of 1943, production was 375,971,000 lb., a decrease of 21 percent below last year.

Chicks hatched by commercial hatcheries in August, 1943, were 29,112,000, compared to 22,427,000 in August, 1943. Chicks hatched in the first eight months of this year totaled 1,332,382,000, an increase of 21 percent over hatchings in the corresponding months of last year.

Fruits, frozen, in storage on October 1, 1943, totaled 220,238,000 lb., compared to 225,104,000 lb. on October 1, 1942, and to a 1938-1942 average of 177,814,000 lb. for the date.

Vegetables, frozen, in storage on October 1, 1943, totaled 160,624,000 lb., compared to 117,796,000 lb. a year earlier and to a 1938-1942 average of 89,764,000 lb. for the date.

Butter, creamery, in storage on October 1, 1943, amounted to 232,435,000 lb., compared to 123,599,000 lb. on October 1, 1942, and to a 1938-1942 average of 163,988,000 lb. for the date.

Cheese, all kinds, in storage on October 1, 1943, was 217,615,000 lb. The figure a year before was 259,078,000 lb. and the October 1 average in 1938-1942 was 171,167,000 pounds.

Eggs, case equivalent, in storage on October 1, 1943, totaled 14,176,000 cases. On October 1, 1942, the number was 11,684,000 cases and the October 1 average in 1938-1942 was 9,557,000 cases.

Poultry, frozen, all kinds, in storage on October 1, 1943, totaled 86,001,000 lb., compared to 115,505,000 lb. on October 1, 1942, and to an average of 85,232,000 lb. in 1938-1942 for the date.

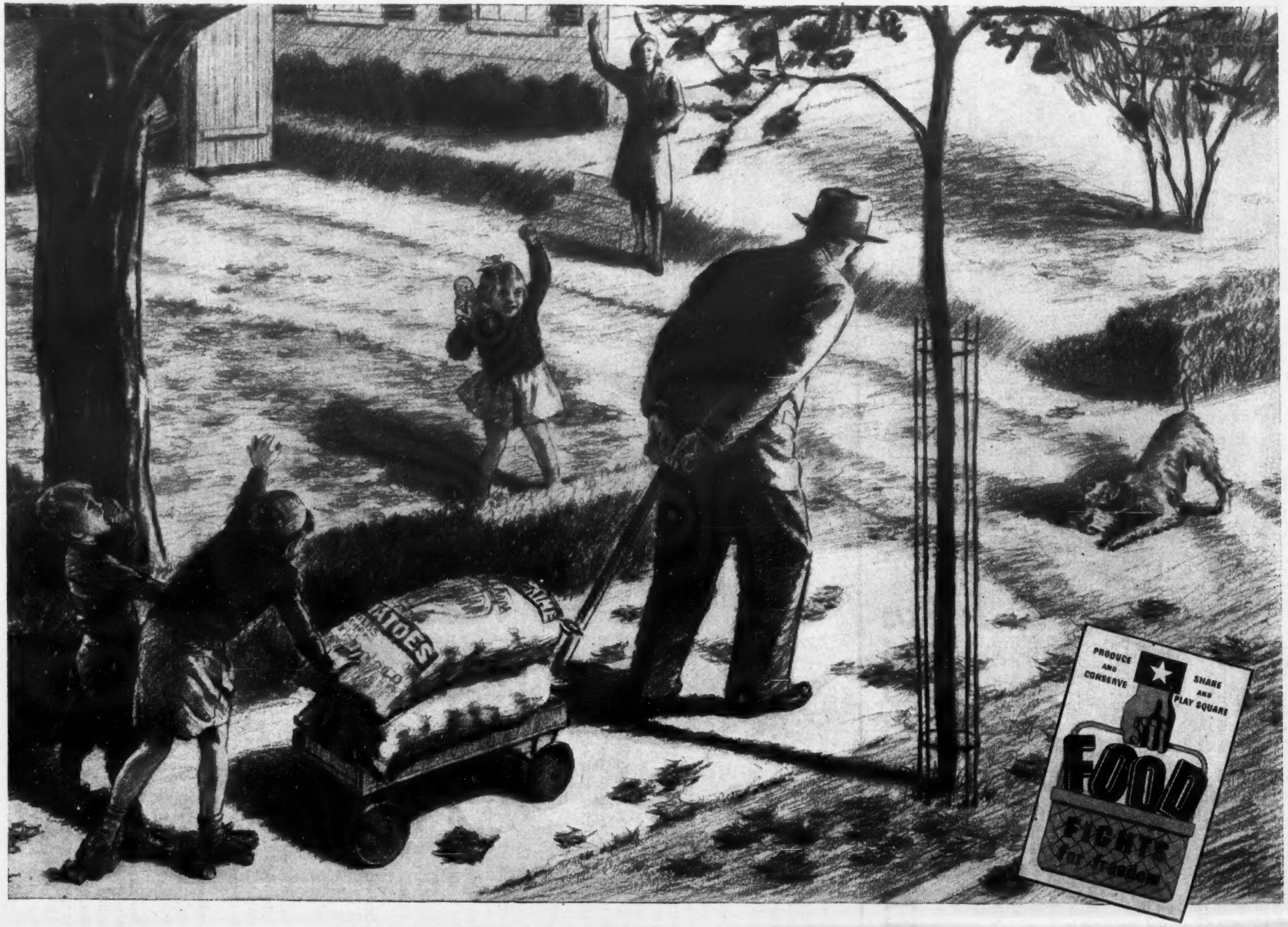
Meat, all kinds, in cure and frozen storage on October 1, 1943, totaled 596,032,000 lb., compared to 456,578,000 lb. a year before and to 432,846,000 lb. as a 1938-1942 October 1 average.

Lard in storage on October 1, 1943, was 160,535,000 lb. and rendered pork fat on the same date was 31,533,000 lb. These figures a year earlier were 54,169,000 lb. and 7,974,000 lb. The combined average figure for the two products in 1938-1942 was 136,907,000 pounds.

Business activity index of *Business Week* for October 9, 1943, was 211.2, compared to 212.4 one month earlier and to 188.2 for the corresponding 1942 date.

Weekly wholesale food price index of Dun & Bradstreet stood at $4.06 on October 12, compared to $3.87 on the corresponding 1942 date.

Cost of living index of National Industrial Conference Board for September, 1943, was 103.1, up 0.3 percent from August, 1943, and compared to an index of 98.8 in September, 1942.



"WHAT? That Fellow Doakes HOARDING POTATOES?"

"WHAT? That Fellow Doakes HOARDING POTATOES?"

Not On Your Life—Uncle Sam Has Asked Him to Help Store This Year's Bumper Crop

Last spring your Government urged the country's potato growers to increase their production of white potatoes. In spite of wartime handicaps, shortages of labor, of fertilizer and of farm equipment, the potato growers of the State of Maine have produced the largest and one of the finest potato crops that the State has ever grown. Similar production records have been achieved by other late potato producing states.

U. S. War Food Administrator, Marvin H. Jones, has said, "This is an achievement of which every American should be proud, for every bushel of these potatoes is needed to help meet the requirements of our fighting forces and our civilian population."

But, although potatoes may be plentiful right now, Mrs. Doakes and her neighbors have not forgotten the potato shortage of the early months of 1943, nor the black market prices that they were forced to pay to keep healthful potato dishes on the family table.

So this fall, while State of Maine potatoes are in good supply and can be purchased at moderate O.P.A. ceiling prices, the Doakes' have determined to lay away a few hundred pounds for use this winter and in the early spring.

Hoarding? Heavens No! Uncle Sam not only approves but urges them and every other American family to buy potatoes this fall in large lots for home storage in order to conserve the bumper crop that the growers of the State of Maine and other states have produced, in answer to their Government's call for more food to help win the war.

Roy F. Hendrickson, Director, Food Distribution Administration at Washington, in a public appeal in the press, urges, "It is necessary for the grower, the food trade, the consumer and the government to unite in a vigorous program of use and conservation of white potatoes during the harvest season to prevent waste of any part of this valuable crop. Your Government urges storage of potatoes on farms, in commercial storage houses, by wholesalers and receivers, chain stores, voluntary cooperative retail groups, super markets and independent vegetable and food retailers."

> Irish Potatoes are hereby designated as a Victory Food Selection for the period October 21 through November 6, 1943. During this period food merchants, eating places, distributors, advertisers and channels of public information in every State of the United States and the District of Columbia, are authorized and urged to feature Irish Potatoes as a Victory Food Selection. Storage of potatoes in homes must be encouraged and large quantities of potatoes must be consumed during the late fall months, relieving some of the pressure on less abundant foods.
>
> MARVIN H. JONES
> U. S. War Food Administrator

As War Food Administrator, Marvin Jones says: *"Storage of potatoes in homes must be encouraged and large quantities of potatoes must be consumed during the late fall months to relieve some of the pressure on less abundant foods."*

So, Uncle Sam is drawing a sight draft on you, the wholesale and retail food trade of America, to do your part so that all the Doakes' in your community can buy and store potatoes at the moderate retail prices that will be in force under O. P. A. ceilings during October and November.

The moving and marketing of this year's bumper potato crop is one of the Government's most crucial food problems. Uncle Sam is marshalling every force at his command to drive home to the nation at large that *we must get this supply of vital food under cover before cold weather sets in.*

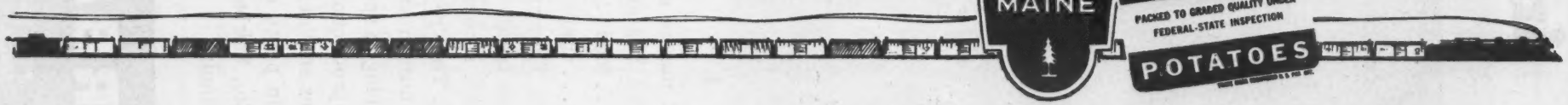
It is YOUR problem too, whether you be food wholesaler or retailer, restaurant or hotel, or the Mr. or Mrs. Doakes of your community. You must buy and store potatoes to the limit of your ability to insure an abundance of this—"Man's Greatest Food" during the winter and early spring.

As "America's Potato Railroad", it is the problem of the Bangor & Aroostook also to provide the facilities to move this bumper crop from "Maine's Potato Empire" to all terminal markets from which it will be distributed throughout the Eastern half of the country.

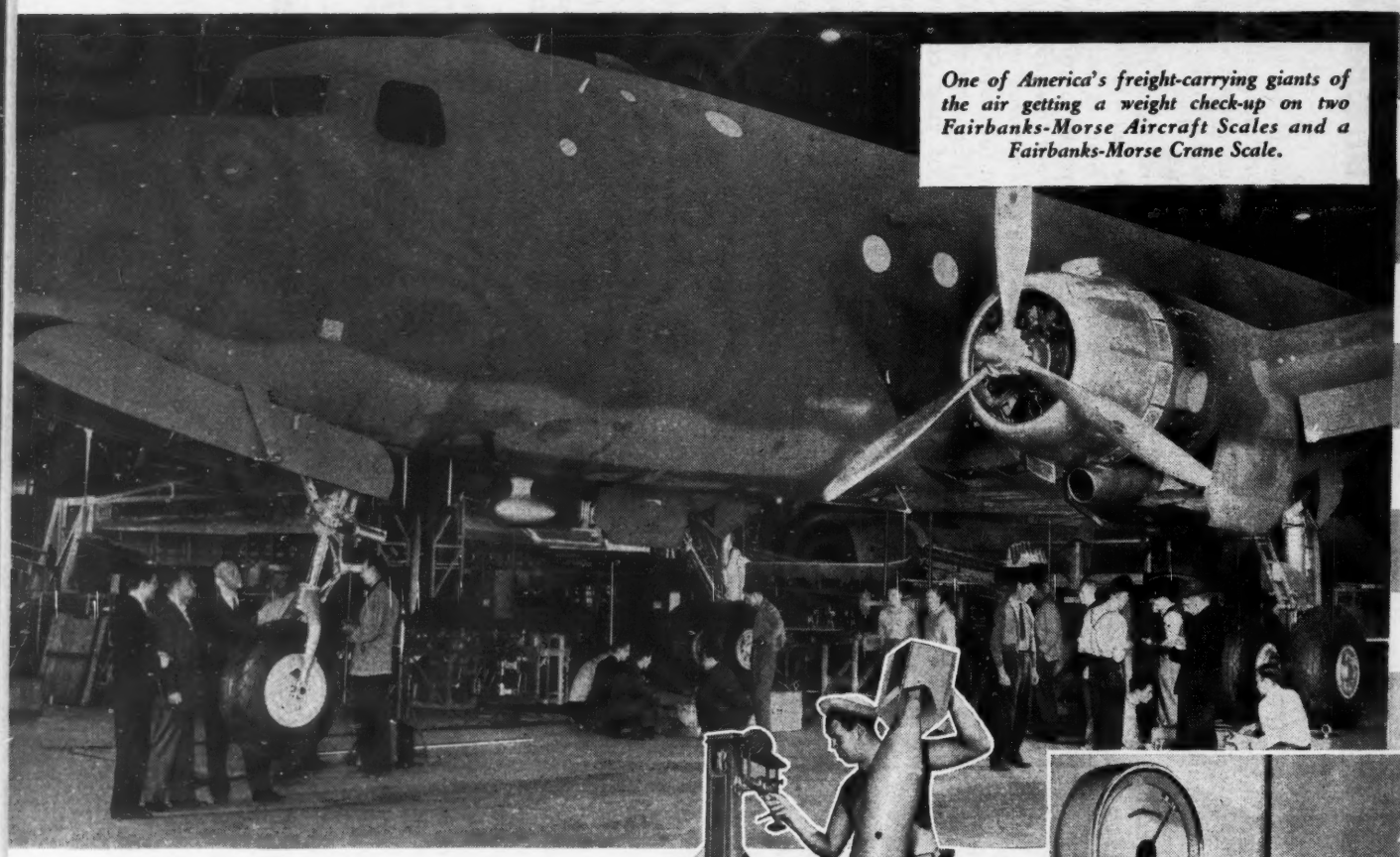
The Bangor & Aroostook Railroad is proud to sponsor this vital message to the food trade of America and through them, to the Mr. and Mrs. Doakes' everywhere, in behalf of its largest and most important customer, the great potato industry of the State of Maine.

Bangor & Aroostook Railroad
Wingate F. Cram, President
Bangor, Maine

In cooperation with the Maine Development Commission



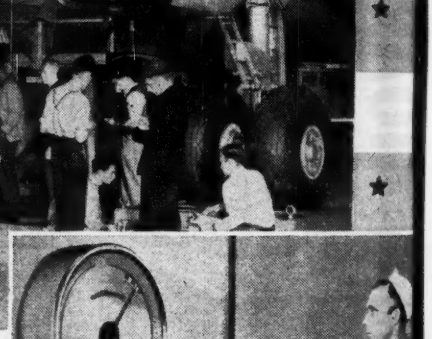
Fairbanks-Morse Scales in Warwork



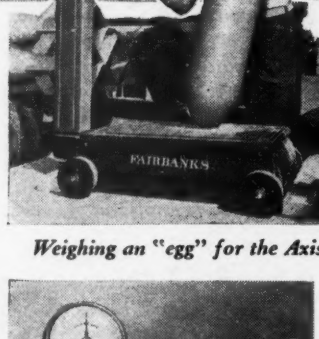
One of America's freight-carrying giants of the air getting a weight check-up on two Fairbanks-Morse Aircraft Scales and a Fairbanks-Morse Crane Scale.

• WARWORK means *weigh-work* for Fairbanks-Morse Scales. They're weighing munitions . . . food . . . chemicals . . . tanks . . . aircraft . . . shells . . . just about everything, in fact. They are weighing at speeds which human hands can't match. They're weighing with accuracy that human eyes can't equal. They're working in endless shifts that human stamina can't endure. They're helping to speed up America's war effort on the production front, for Fairbanks-Morse Scales are "at home" on the production front, in peace or in war. Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago, Illinois.

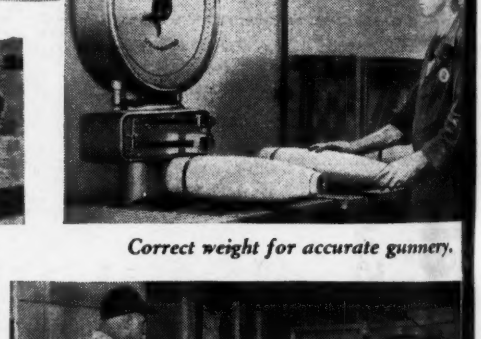
Weighing an "egg" for the Axis.



Correct weight for accurate gunnery.



Frozen eggs—NOT for the Axis!



Weighing charging materials at iron works furn

FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
WATER SYSTEMS
SCALES
STOKERS
FARM EQUIPMENT
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales

MEN • JOBS • COMPANIES

RALPH B. THOMAS

Harold H. Clapp, Inc., Rochester, N. Y., manuufacturer of baby food, has appointed Ralph B. Thomas to the office of vice-president in charge of production. He is also secretary and treasurer of Harold H. Clapp Co., Ltd., Montreal, Canada, and a director of that firm. His new duties will include supervision of manufacturing operations of all the Clapp plants as well as the G. Washington Coffee Refining Co. at Morris Plains, N. J.

INDUSTRY

Armour & Co., Chicago, and its principal subsidiary, Armour of Delaware, have recently merged into Armour & Co., with headquarters in Chicago.

Beatrice Creamery Co., Chicago, has purchased Delicia Ice Cream Co. in Nashville, Tenn., and La Choy Food Products, Inc., Archbold, Ohio. The company's acquisition of the two organizations will further extend the distribution of its dairy products.

Burry Biscuit Co., in line with its expansion program in the general foods field, has purchased Simple Simon Foods of Detroit, Mich., processors of dry mixes.

California Vegetable Concentrates, Inc., has moved its main offices from Los Angeles, Calif., to Huntington Park, Calif.

Claridge Food Co., Flushing, L. I.; J. W. Greer Co., Cambridge, Mass.; the Plymouth, Wis., plant of Lakeshire-Marty Co., a division of Borden Co.; and Phillips Packing Co., Inc., Cambridge, Md., have been awarded the Army-Navy "E" for high achievement in the production of foods for the armed forces.

Continental Packing Co. has recently completed a new plant at Macon, Ga., which has a daily production capacity of 10 tons of sweet potatoes.

Fresh-Dry Food, Inc., newly constructed dehydrating plant in Camden, S. C., has begun operations with a capacity output of 40 tons a day.

Frye & Co., Seattle, Wash., plans to construct a $500,000 meat packing plant to replace the one partly destroyed by fire last February.

Gerber Products Co., producers of canned and packaged baby foods, has acquired Elmhurst Packers, Inc., Oakland, Calif.

Lucerne Vineyard, Hanford, Calif., is building its third dehydrater as part of its program to dehydrate several thousand tons of grapes. After the grape crop has been processed, the dehydrater will be used to process vegetables.

McCormick & Co., Inc., Baltimore, Md., has established a potato dehydrating plant in Aroostook County, Maine.

Northeastern Packing Co., with headquarters at Franklin, Me., has purchased A. & R. Loggie Co., frozen food packers.

A. Perelli-Ninetti & Sons of McFarland, Calif., has constructed a grape dehydrating plant at a cost of $50,000.

Peter Paul, Inc., is now operating a coconut shredding plant which processes coconuts for candy manufacturers in Santana, Arecibo, Puerto Rico.

Sanib Corp., New York, plans to increase the supply of dehydrated bananas to the American market by 200 percent. The company has contracted to take the entire output of dehydrated Mexican bananas produced by Industrial Platanera Martinez & Co. of Orizaba, Vera Cruz, Mexico.

ELSIE SINGRUEN

Roth, Schenker & Bernhard, Inc., Chicago, Ill., has elected Elsie Singruen as chief food technologist of the Food Products Division. Well known as a cereal chemist and fermentologist, Miss Singruen has been doing yeast development work since 1929, and recently gained wide recognition for her research concerning the recovery and utilization of brewers' surplus yeast.

ALLIE J. FRALINGER

Allie J. Fralinger has been elected vice-president in charge of production for Deerfield Packing Corp., Bridgeton, N. J. A member of the board of directors for the past 10 years, Mr. Fralinger has served the Deerfield plants in this capacity since March of this year.

Vita-Fresh Juice Co., Los Angeles, Calif., has changed its name to Dairy-Fresh Products Co., with no change in personnel.

Weldon Packing Co.'s plant at East Palatka, Fla., will begin operations on Nov. 1, packing green and stringless varieties of Lake beans.

PERSONNEL

Jack Ball and **John W. Luscombe**, formerly head of production and treasurer, respectively, of Kasco Mills, Inc., Toledo, Ohio, have been elected vice-presidents of the company.

Walter Bentz has been appointed vice-president of Lamborn & Co., Inc., succeeding Esmond Nutter who has resigned. He will be in charge of the New Orleans office.

Alex Buchanan, who has been manager of the Shelby, N. C., plant of Carnation Co., will now direct the company's new milk processing plant at Dadeville, Ala.

James P. Carey, Jr., has been elected chairman of the board of Roberts & Oake, Inc., pork packers.

Theodore P. Daly has been promoted to manager of the Detroit, Mich., branch of

YES! . . . . . .

EVERY Potato Chip has UNIFORM QUALITY!

A continuous flow of uniformly-finished potato chips is assured with

FERRY CONTINUOUS POTATO-CHIP MACHINES

The "profitable" potato chip is one that has uniform size, color and saltiness. Ferry Machines make chips having *all* these qualities . . . because the whole process is done automatically—with precision!

You merely feed raw, unpeeled potatoes into the machine, and by push-button control they're automatically peeled, washed, sliced, conditioned, dried, fried, salted and cooled.

Ferry Machines are compact . . . rigidly built in 5 various sizes . . . produce from 50 to 450 lbs of finished chips per hour, depending on the size machine.

There's lots more to know about Ferry. Write immediately for Bulletin F-1.

Also makers of
SLICERS AND AUTOMATIC SLICERS FEEDERS AND CAN WASHING MACHINERY

J. D. FERRY CO.
129 SO. CAMERON ST.
HARRISBURG, PA.

O. B. BRIGGS

Formerly assistant manager of the Special Products Department of Standard Brands, Inc., O. B. Briggs has been promoted manager of the division succeeding A. C. Lemkau, who has retired. Mr. Briggs has been instrumental in developing the market for vitamin D for animals and in establishing Irradiated Dry Yeast as a widely used source of Vitamin D for this purpose.

Fairmont Creamery Co., succeeding John Legg.

Hubert S. Davis, FDA representative at Lakeland, Fla., has been appointed fruit buying specialist and public relations director for Citrus Concentrates, Inc., Dunedin, Fla.

Herbert E. Gray, president of Barron-Gray Packing Co., San Jose, Calif., has been elected president of the Canners League of California, succeeding Carl N. Lovegren, who has recently resigned to become chief of OPA's Food Price Division for processed foods. Preston McKinney has been reelected executive vice- president of the League.

W. L. Heald, formerly assistant chief chemist of W. E. Long Co., Chicago, Ill., has been appointed chief chemist for Colorado Milling & Elevator Co., Denver, Colo., succeeding H. D. Liggett.

Elbert K. Hickman, production superintendent of the John Morell & Co. plant at Ottumwa, Iowa, has resigned to become superintendent of Tobin Packing Co.

H. C. Jordan, manager of Kraft Cheese Corp. at Carlisle, Ark., has been promoted to supervisor in Missouri, with headquarters at Springfield.

James Larrimore, director of the government supply division of Loose-Wiles Biscuit Co., is assisting in the management of the company's New York bakery.

E. G. Laughrey, former bacteriologist for Corn Products Refining Co., is now a member of the research department of Pabst Brewing Co., Milwaukee., Wis.

Joseph B. Pardieck has been elected a director of the National Dehydrators Association, succeeding L. P. Simms, who has resigned. Mr. Pardieck is vice-president of California Vegetable Concentrates, Inc.

Isabelle Peterson has been appointed consulting dietitian on Swift & Co.'s research laboratories staff. Miss Peterson has had wide experience in supervising industrial cafeterias and in institutional management.

Paul Sartori, of S. & R. Cheese Co., Plymouth, Wis., has been named president of the newly formed American Producers of Italian Type Cheese Association, Inc., with headquarters in Fond du Lac, Wis.

A. M. Shultz has been elected to succeed the late Roy M. Davis in all controller functions of the frosted foods units of General Foods Corp.

Arthur A. Smith, vice-president in charge of sales for California & Hawaiian Sugar Refining Corp., Ltd., has been appointed first vice-president of the company.

D. H. Stringham, president of Royal Canning Corp., Ogden, Utah, has purchased control of Spokane Valley Canning Co.

R. T. Thomas of Alamo, Tex., plans to construct a $40,000 vegetable and citrus packing plant in Pharr, Tex.

R. C. Treon has been appointed manager of the Wilson & Co.'s packing plant in Atlanta, Ga.

George W. Weber has been named manager of the Mercedes Citrus Growers newly organized division of Rio Grande Valley Citrus Exchange.

UNITED FRUIT MEDAL

Designed by the famous sculptor, Paul Manship, for the United Fruit Co., the above medal will be awarded to the company's sea-going personnel for meritorious service, beyond the call of duty and in action with the enemy. Made in both gold and silver, the medal differs from the usual treatment of circular medals in that the free silhouette of the mariner's anchor is outside the circumference of the medal.

DEATHS

George L. Bertram, 43, district manager for the Birmingham, Ala., plant of Best Foods, Inc., recently, in Birmingham.

Francis C. Callert, 47, wholesale manager of Ebling Creamery Co., Detroit, Mich., recently, in Detroit.

David Cohn, 56, founder and president of Kansas Packing Co., New York, Oct. 3, in Amityville, L. I.

George G. Keith, 57, president of Hermitage Feed Mills, Nashville, Tenn., Sept. 29, in Nashville.

W. Bryan O'Daniel, 45, formerly district manager for General Foods Sales, Inc. in Philadelphia, Pa., Sept. 28, in Ardmore, Pa.

O. E. McMeans, 74, consulting engineer and an authority on food packing plants, recently, in Indianapolis, Ind.

Linden B. Tompkins, 59, general field manager of Monitor Sugar Co., Bay City, Mich., recently, in Bay City.

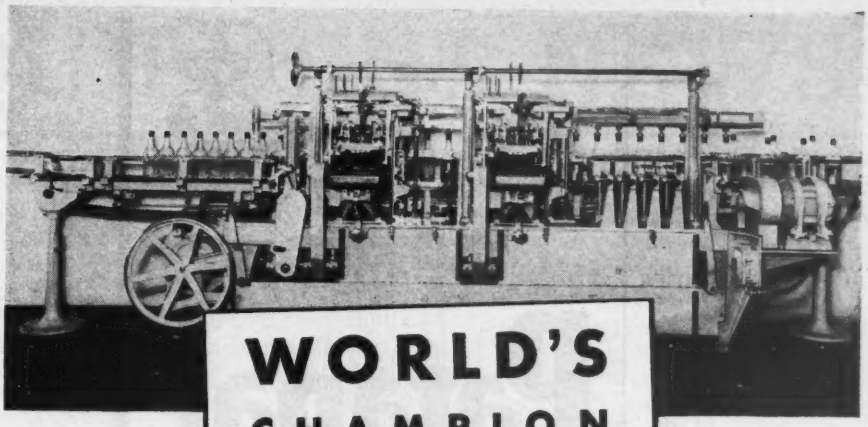
ASSOCIATED INDUSTRIES

American Steel Package Co.'s Defiance, Ohio, plant; the Front Royal, Va., plant of American Viscose Corp.; Creamery Package Manufacturing Co., Chicago, Ill.; the Parlin, N. J., photo products department of E. I. du Pont de Nemours & Co., Inc.; Elyria, Ohio, division of Pfaudler Co.; and Package Machinery Co., Springfield, Mass., have been presented the Army Navy "E" for excellence in production. A third star for their pennants has been awarded to the Camden plant of the Victor Division of Radio Corp. of America and Fulton Sylphon Co., Knoxville, Tenn., while Jenkins Bros., Bridgeport, Conn., is flying an additional gold star on its "M" pennant.

Dicalite Co., Los Angeles, Calif., manufacturer of filter aids, insulation and absorbents, has appointed A. L. Gossman, president of the organization, succeeding C. A. Frankenhoff, who becomes chairman of the board.

Dobeckmun Co., Cleveland, Ohio, has named Karl E. Prindle director of product development, and Ross C. Betts, formerly plant manager, director of technical development. Mr. Prindle developed the original method for moisture proofing cellophane.

St. Regis Paper Co., New York, has recently completed plans for the immediate construction of a multiwall paper bag manufacturing plant in North Kansas City, Mo., for domestic and overseas shipments. The plant will be in full operation early in 1944 when it will make sewn pasted, valve and open-mouth bags and shipping containers, as well as small flour bags and sugar pockets.



WORLD'S
CHAMPION
In the
Light Weight Glass Class

The WORLD Automatic BEE-LINE Straightaway Labeler takes 'em gently but firmly through the complete labeling operation in a bee-line, without stops, detours, collisions, jars or jams.

The one pictured above has twin labeling station to handle two bottles at a time at the most efficient operating speed.

The Model HG labels gallon or half-gallon jugs, jars or bottles with equal efficiency and economy.

WORLD BEE-LINE Labelers are the world's best labeling bet, *now*, if you have the priority, or *post-war*, to meet the greater needs of better times to come.

For full information or for assistance on your present labeling problems get in touch with WORLD labeling headquarters.

WORLD LABELERS

ECONOMIC MACHINERY COMPANY

Builders of World Automatic and Semi-Automatic Labelers for Every Purpose

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Reproduction of column appearing in national news magazines.

Patapar ...strong when wet

Remarkable fact—Patapar* Vegetable Parchment can be soaked in water for weeks—even boiled, and it will remain firm and strong.

Resists grease, too

When Patapar meets with grease, fats or oils it resists penetration.

These characteristics—so unusual for paper—have enabled Patapar to solve hundreds of difficult packaging problems. Butter, meats, fish, cheese, lard, shortening, ice cream are a few of the products that are protected in Patapar.

BUSINESS MEN:

Pressing war assignments, government orders and the everyday essential needs of Patapar are more than can be met with the limited supply of raw materials at present available.

Until Victory comes there will be necessary inconveniences. Shipments of Patapar must sometimes be delayed. We can only ask that you bear with us until peacetime service is restored.

*Reg. U. S. Pat. Off.

Patapar is the outstanding material for:

WRAPPERS for butter, meats, fish, cheese, poultry, shortening, ice cream, vegetables, dried fruits

CARTON AND BOX LINERS

BULK PACKAGING UNITS

MILK CAN GASKETS

MILK BOTTLE HOODS

PACKAGING COFFEE AND TEA

And many other uses

Paterson Parchment Paper Company
Bristol, Pennsylvania

West Coast Plant: 340 Bryant St., San Francisco
Branch Offices: New York, Chicago

Headquarters for Vegetable Parchment since 1885

FOOD EQUIPMENT NEWS

Can Marking Ink

KIENLE & Co., 33 Nassau Ave., Brooklyn, N. Y., has brought out a can marking ink, for indelibly marking product name or code marks on cans before labeling, as required by QMC Tentative Specification CQD No. 107. The product is known as S.D. Can Marking Ink AK-1600, and is said to have, in addition to good work qualities, high resistance to processing. It is based on an alcohol-type solvent and is fast drying, so that cans can be labeled immediately after marking.

Colorimeter

PHOTOVOLT CORP., 95 Madison Ave., New York, has brought out the "Lumetron" photoelectric colorimeter Model 400-H, particularly suited to the standardization of color of fruit juices and beverages. This is a self-contained, portable instrument, operated by built-in dry cell battery, for use in the plant or elsewhere.

The colorimeter is a single filter instrument. If not specified otherwise, it is furnished with a built-in filter that makes the response of the photocell equal to the color sensitivity of the human eye. With this filter, the instrument is also suited to measurements of turbidity. For applications requiring readings to be taken within a limited spectral band, the instrument can be furnished with a color filter isolating the wave band in question.

Among the applications of this colorimeter are included: Determination of pH of water and other colorless liquids; determination of bacteria growth in microbiological tests; determination of degree of pasteurization of milk; and determination of turbidity of sugar sirups. It is also used for checking and standardizing the color of such liquids as wine, beer and fruit juices.

This colorimeter is built into a wooden housing, 5x6x15 in., and has a cover and carrying strap.

Lift Truck Attachment

TO FACILITATE the handling of higher stacks of bags, cases or other loads, which normally would extend above the top of the lifting carriage backrest of a standard lift truck, Towmotor Corp., 1226 E. 152nd St., Cleveland, Ohio, has developed a carriage backrest extension. This provides increased support and minimizes the possibility of shifting while high loads are being lifted, moved and stacked.

Of welded steel construction, the extension is quickly attached by inserting its permanently attached pins into sockets welded to the standard lifting carriage. The model illustrated extends 60 in. above the surface of the lifting forks. Other models, increasing carriage backrest height from 48 to 72 in. above forks, are available.

Extinguisher Safety Seal

GENERAL DETROIT CORP., 2272 East Jefferson St., Detroit 7, Mich., is marketing the "General Safety Seal," a device to prevent tampering with fire extinguishers or clogging of their outlets.

Tamper-proof seals for fire extinguishers.

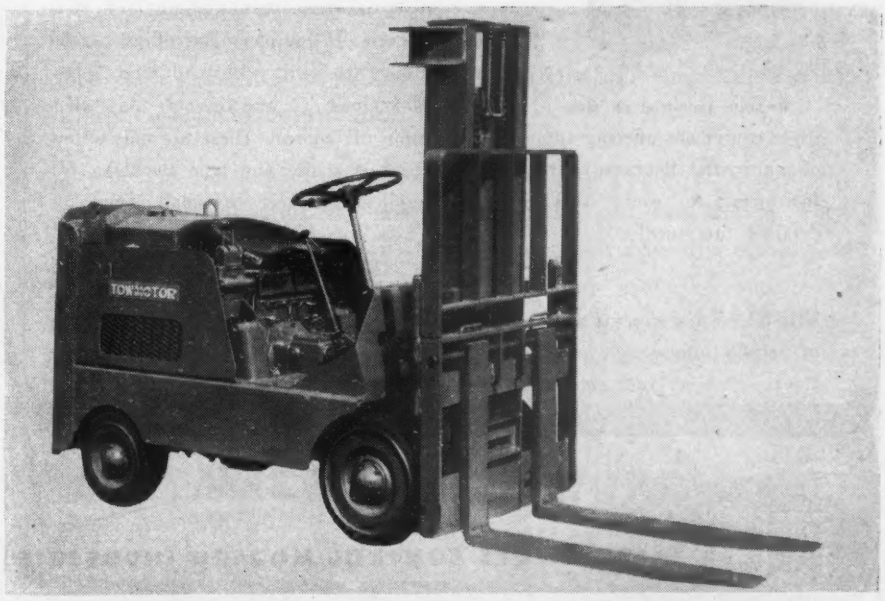
The seal is made in models to fit all standard types of extinguishers.

Constructed of heavy water-repellent paper stock, there are three standard types of this seal. Foam and soda acid extinguishers are protected by a stitched envelope that slips over the hose and fastens around the control valve. Vaporizing liquid extinguishers are fitted with two caps, one covering the pump end and the other protecting the nozzle. Carbon dioxide extinguishers are guarded by a cup-type envelope that fastens tightly over the nozzle horn. All protective envelopes or caps are secured by tamper-proof wire seals. The envelope cannot be removed or the extinguisher used without breaking the seal. Thus the extinguisher cannot be tampered with or become clogged without warning, and the danger of explosion is reduced.

Filling Machine

A FILLING MACHINE for dry products, equipped with a special automatic two-way conveyor that returns the filled container to the operator has been developed by Triangle Package Machinery Co., 906 No. Spaulding Ave., Chicago. It is designed for production set-ups where it is desired to have the intake of empty containers and the delivery of filled containers at the same point. This permits one operator to handle the entire operation.

This filler is built in a range of sizes to handle containers from 1 to 24 oz. capacity. Any one model will handle a maximum of approximately 1½ times



Carriage backrest extension for standard lift trucks.

Food is VITAL!

Reduce waste with *Beckman* pH Control

WHEREVER pH *(alkalinity or acidity)* affects the quality and uniformity of food processes, Beckman pH control can yield important savings by insuring better pack, consistent high quality and reduced spoilage. For example . . .

pH APPLICATIONS

BAKING
BOTTLE WASHING
BREWING
CANNING
CARBONATED BEVERAGES
CASEIN PRODUCTS
CHEESE MAKING
FOOD LABORATORIES
FRUIT JUICES
GELATIN PRODUCTS
JELLY MAKING
MALTING
PHARMACEUTICALS
SALAD DRESSING
SUGAR REFINING
VITAMIN PRODUCTS

JELLY MAKING

In commercial jelly making, Beckman pH control plays an important part in reducing waste and insuring uniformly high quality of product.

Practically every major change in the character of the jelly is brought about by very slight changes in the pH of the mix. On a typical mix, at pH 3.0 to 3.1 a jelly of maximum stiffness is obtained . . . at 3.2 a jelly of medium stiffness . . . at 3.3 a tender jelly . . . and at pH values above 3.5 no jell formation occurs at all. Or on the increasingly acid side, at pH 2.8 "weeping" occurs . . . at 2.6 a white precipitate forms that makes the product unmarketable . . . and below this value jell again refuses to form.

Without *accurate* pH control every run is a gamble. But *with* it, each run is under complete control. Over- and under-acid fruits can be allowed for. Spoilage is minimized. Quality and uniformity are assured. And important savings are made in production costs!

Beckman Industrial pH Meter

BECKMAN is the *only* modern pH equipment that can be used in boiling hot process solutions (invaluable in sugar refining and other food processes) . . . and in highly alkaline solutions, even in the presence of sodium ions. It is the *only* modern pH equipment providing rugged glass electrodes that will withstand direct pressures to 100 pounds . . . and the *only* glass electrode equipment offering automatic six-station pH control. These are only a few of *many* vital Beckman advancements. There is a size and type Beckman pH Instrument for every food processing application, large or small. Send for detailed literature!

FREE! *What Every Executive Should Know About pH—a booklet of helpful informative facts on modern pH control and its applications. Send for your copy today!*

BECKMAN INSTRUMENTS
NATIONAL TECHNICAL LABORATORIES
South Pasadena California

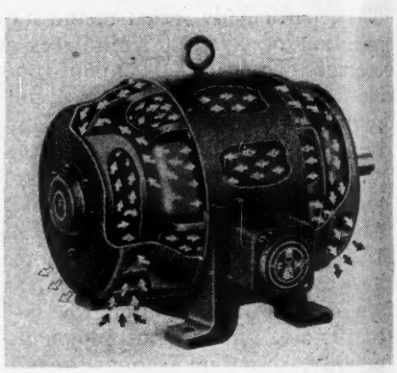
BECKMAN INSTRUMENTS CONTROL MODERN INDUSTRIES

the minimum. Production is from 40 to 60 cans per minute. A feature is the control that automatically prevents discharge when the supply of containers is exhausted.

All-Purpose Motor

FAIRBANKS-MORSE & Co., 600 S. Michigan Ave., Chicago, has announced a line of all-purpose, continuous duty, polyphase squirrel cage induction motors. These motors embody the centrifugally-cast "F-M Copperspun" rotor, and are said to be fully protected against falling particles, dripping liquids and other industrial motor hazards. Bearings are ball bearings sealed in cartridge-type housings. Cross-flow ventilation is obtained through protected inlets and exhausts at each end of the motor are said to give uniform cooling and to eliminate hot spots. The frame is cast in one piece, with rib sections to give increased strength.

Another new feature of this motor is the conduit box. Where space is limited, the conduit can be brought up between the motor feet to the tapped hole in the motor frame and the conduit box cover assembled flush with the frame. The extended box is then discarded. When the conventional conduit box is used it can be mounted in any one of four positions.

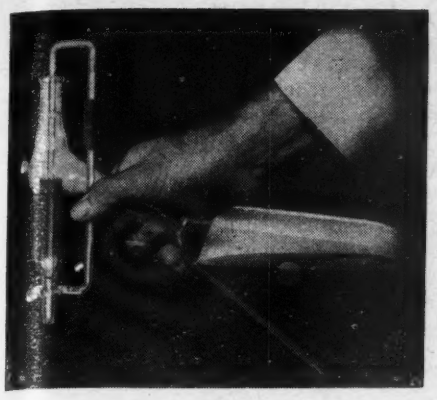


New type polyphase squirrel cage induction motor.

The motor is rated 40 deg. C. and is designed to carry 115 percent loads continuously without injurious heating.

Automatic Pipette

MACALASTER BICKNELL CO., Washington and Moore Sts., Cambridge, Mass., has introduced an "automatic" pipette, said to speed up certain laboratory operations and to increase accuracy. Referring to the accompanying illustration, the measuring chamber is filled (slightly to overflowing) by tilting the flask to pouring position. When the flask is returned to vertical, the surplus drains back, leaving the chamber with an exactly predetermined volume. Chamber contents is drained to the beaker by raising the plunger-lever with the



"Automatic" pipette for laboratory use.

thumb, or by engaging the rim hook with the far rim of the beaker and pressing downward.

Dispenser assemblies may be had for pipetted quantities from 5 to 100 cc., each dispenser operating with flasks of 250, 500, 1,000, 1,500 or 2,000 cc.

Stoneware That Resists Thermal Shocks

U. S. STONEWARE CO., Akron, Ohio, has brought out "Ceratherm 500," a chemical stoneware that is said to withstand violent thermal shocks. This low-porosity material can be heated directly by steam or hot gases and then cooled quickly. In addition, like other chemical stoneware, it is inert to attack by acids, alkalis and solvents, except hydrofluoric acid and hot caustics.

The makers state that this stoneware can be readily fabricated into equipment of a wide variety of shapes and sizes, including large equipment. Among the items made from this material are included tanks, kettles, coils, pumps and pipe.

Vessel of chemical stoneware that resists severe thermal shock.

OUR STORY IN PICTURES LEAVES NOTHING UNTOLD

★Within fifty-six pages profusely illustrated is as much of the story of the adaptability, economy and efficiency of overhead handling with AMERICAN MONORAIL EQUIPMENT that can be told without personal consultation.

If you are interested in producing more war material and at the same time preparing for post-war activities, do two things. First, send for American MonoRail Picture Book, see how this equipment is efficiently serving hundreds of handling jobs. Second, send for the American MonoRail Engineer to show you additional advantages to your individual problem. Write for your copy today!

THE AMERICAN MONORAIL CO.

13125 Athens Avenue ★ Cleveland 7, Ohio

Barrels of Fun!

TOWMOTOR *SUPPLIES THE "MUSCLE"*

Towmotor operators are a happy group. Why not—with the entire work burden placed on capable Towmotor! Power, speed and operating flexibility—available and ready at finger-tip control—enables the operator (man or woman) and his Towmotor to accomplish the work of a full gang of manual handlers . . . safely and without any back-breaking effort for him, and faster and cheaper for his employer.

Moving loads up to 10,000 pounds, as fast as 880 feet a minute; storing them as high as 25 feet—that's what Towmotor contributes to production schedules and space-saving storage possibilities. Complete information is contained in Towmotor's new "Data File." For your free copy address Towmotor Corporation, 1222 East 152nd Street, Cleveland 10, Ohio.

TOWMOTOR

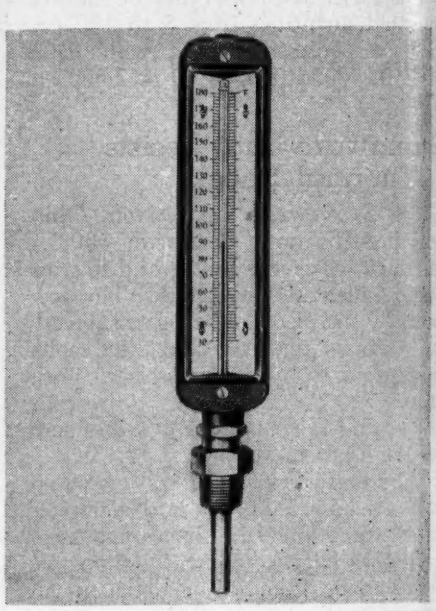
THE 24-HOUR ONE-MAN-GANG

Protective Coating

For protective linings for tanks, and for protecting machinery and other equipment in food plants, American Pipe & Construction Co., Box 3428, Terminal Annex, Los Angeles, Calif., has developed "Amercoat No. 33." This is a thermoplastic coating that can be applied to metal, concrete or wood. It can be applied with spray or brush and protects against corrosion by acids and caustics.

Industrial Thermometer

C. J. Tagliabue Mfg. Co., Park & Nostrand Aves., Brooklyn, N. Y., is now making industrial thermometers with plastic case fronts, yellow-back lens-front



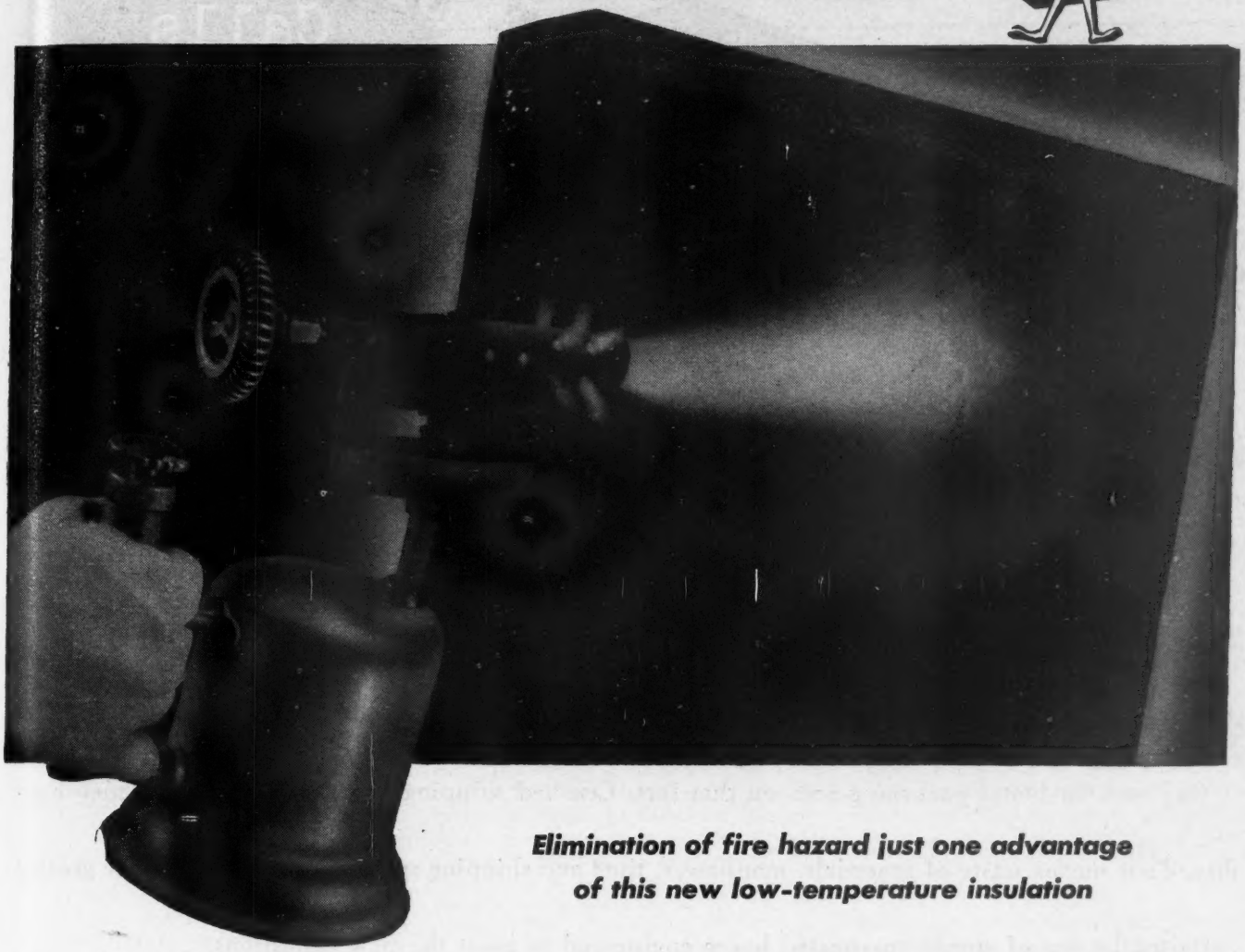
Industrial thermometer designed for easy reading.

easy-reading tubing, and malleable iron backs. The plastic case front reduces weight and adequately substitutes for metal. It is not affected by the temperatures found in service conditions. The yellow-back tubing offers a good color contrast to the mercury column, making for easy reading. The malleable iron back is protected against corrosion by a durable black finish.

Floor Cleaner

Fidelity Chemical Products Corp., 430 Riverside Ave., Newark, N. J., is distributing "Absorbo," an oil and grease absorbant and floor cleaner, for reducing fire and slipping hazards and for cleaning. It is a nonabrasive, granular material and is said not to damage machinery. It is also said to be odorless, non-poisonous and non-injurious to skin, clothing or flooring. It will absorb from 45 to 50 percent of oil or grease by weight.

FOAMGLAS PASSES THE *BLOW-TORCH TEST*



Elimination of fire hazard just one advantage of this new low-temperature insulation

IF YOU'VE BEEN LOOKING for an efficient insulation that will not burn, you've found it now—Armstrong's Foamglas. This material is as fireproof as glass—because it is glass in a brand-new form.

Foamglas is made up entirely of tiny, sealed cells in which there is a slight vacuum. These cells give Foamglas the excellent insulating qualities which make for accurate temperature control and refrigeration savings. And look at its other outstanding advantages:

MOISTUREPROOF Armstrong's Foamglas is just as resistant to moisture as a pane of window glass. Neither water nor vapor can penetrate it. Thus Foamglas can be counted on to keep its original insulating efficiency *permanently!*

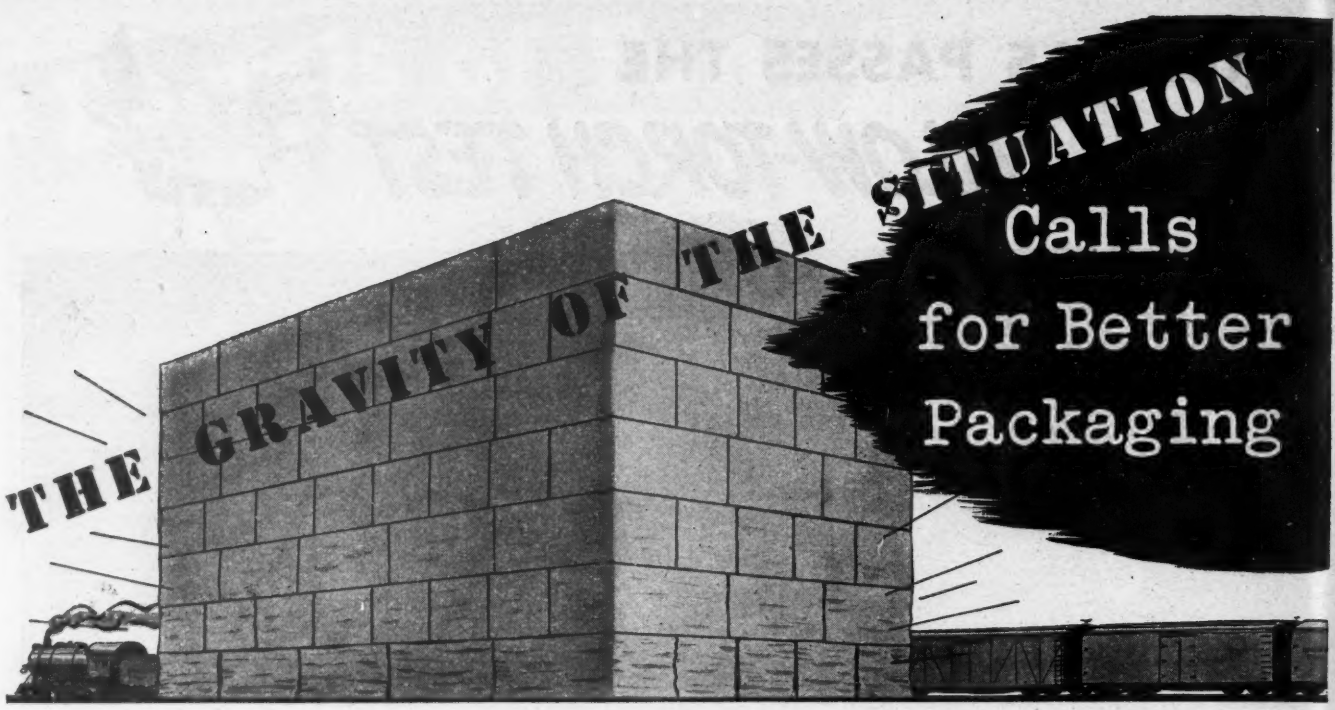
STRUCTURALLY STRONG Armstrong's Foamglas has unusually high compressive strength—an average of 150 lbs. per sq. inch. That means Foamglas walls are entirely self-supporting—and no expensive wooden or metal framing members are needed for its erection.

Add to these "big three" advantages the plus values of light weight and easy workability, and you'll know why this new material is well worth investigating. Why not find out about it now? Just drop us a line and ask for our free booklet, "Armstrong's Foamglas," which gives full information about the physical properties of this unusual insulating material. Address Armstrong Cork Co., Building Materials Div., 4211 Concord St., Lancaster, Pa.

ARMSTRONG'S FOAMGLAS

A product of Insulation Headquarters

Corkboard • Mineral Wool Board • Cork Covering



AN AVERAGE of five more tons per car . . . that's the war-load being shouldered by the railroads. And that's why "floored" shipping boxes must support many more pounds per package.

One case for better packaging rests on that fact. Crushed shipping boxes mean damaged merchandise. That means waste of materials, manpower, time and shipping space . . . waste that can be greatly curtailed by use of sturdy corrugated boxes engineered to meet the new conditions.

Ask an H & D Package Laboratory to check your shipping boxes. A few pennies more in the right place may enable you to cut losses enormously.

Protect the Product

BETTER SEE H&D AUTHORITY ON PACKAGING

PACKAGING "TEXT-BOOKLETS" FREE

Here's a handy source of practical shipping information to help you solve day-to-day shipping problems. It will pay you to take this "refresher-course" in packaging. The cost? A penny post card. Mail your requests to . . .

HINDE & DAUCH, Executive Offices:
4309 Decatur Street, Sandusky, Ohio

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JUST OFF THE PRESS

BOOKLETS • LITERATURE • BULLETINS

FOOD PLANT EQUIPMENT

Air Conditioning—The "Hermetically-sealed" compressors used in air conditioning and industrial refrigerating units are described and illustrated with diagrams covering the principles of air conditioning in 20-page booklet 3AC-0201, issued by Westinghouse Electric & Manufacturing Co., East Springfield, Mass.

Magnetic Equipment—Practical information for operating and maintaining magnetic pulleys and other types of separators, as well as a table of capacities and dimensions for 12- to 48-in. diameter pulleys, is given in a 40-page catalog published by Dings Magnetic Separator Co., 509 E. Smith St., Milwaukee 7, Wis.

Proportioning Equipment—Bulletin No. 1700, illustrating and describing a complete line of constant-rate and flow-responsive proportioning equipment used in such operations as sterilization, saponification and clarification of vegetable oils, boiler-water conditioning and the maunfacture of plastics and synthetic rubber, has been issued by Proportioneers, Inc., 9 Codding St., Providence 1, R. I.

Vibratory Handling Equipment—Typical installations and applications of various types of Syntron vibratory material-handling equipment, such as electric vibrators, vibrating feeders, gravimetric feeder machines and hydraulic vibrators, are shown in 64-page Catalog No. 435, issued by Syntron Co., Homer City, Pa.

PLANT SUPPLIES

Case Sealing—"So You Know All About Case Sealing" is the title of a booklet describing the proper care and use of various adhesives and discussing problems encountered in export shipping, published by F. G. Findley Co., P. O. Station B, Milwaukee, 5, Wis.

Diesel Engines—Information on design, manufacture and service facilities for stationary Fairbanks-Morse Diesels is found in a 24-page illustrated catalog, Bulletin 3000A, released by Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5. Included with the bulletin is a loose-leaf supplement sheet giving detailed operating cost data for typical municipal plants.

Glass Blocks—"Methods of Replacing Worn-Out Windows With Insulux Glass Block" are described in detail, together with photographs of typical installations, specifications and technical data, in a 24-page booklet published by Owens-Illinois Glass Co., Insulux Products Division, Toledo, Ohio.

Lubrication—A method of providing positive lubrication under high pressure to a group of bearings in exact measured amounts by using the "Multival System" is described in an 8-page illustrated booklet, Bulletin No. 15, put out by Farval Corp., 3293 E. 80th St., Cleveland 4, Ohio.

Motor Maintenance—Photographs and diagrams of ball-bearing motor end-bells and brackets, showing the conversion of sleeve-bearing electric motors to ball-bearing operation to decrease maintenance time and material, are given in a 6-page pamphlet, "Electric Motor Maintenance," put out by Keystone Electric Co., 1226 Ridgely St., Baltimore, 30, Md.

Power Transmission—How to conserve manpower, increase production, reduce costs and maintain equipment through a planned power transmission program is described in a 31-page catalog, "Is Industry's Power Transmission Program Geared to War Production Demands?" issued by Cling Surface Co., 1048 Niagara St., Buffalo, N. Y.

Protective Coatings—"Lithoform," a non-inflammable liquid chemical to make paint adhere to such surfaces as galvanized iron, zinc, cadmium and other metal surfaces, is described in a folder issued by American Chemical Paint Co., Ambler, Pa.

Pumps—Specifications and performance tables of various kinds of Westco turbine-type pumps designed for capacities up to 200 gal. per minute, and heads up to 350 ft. in single-stage construction or 600 ft. in tandem construction, are given in a 60-page illustrated catalog issued by Joshua Hendy Iron Works, Pomona Pump Co. Division, 206 E. Commercial St., Pomona, Calif.

Squirrel-cage Motors—Motor characteristics, frame sizes, dimensions and pictures of Fairbanks-Morse polyphase squirrel-cage motors are given in 12-page Bulletin 1160, put out by Fairbanks, Morse & Co., 606 Michigan Ave., Chicago.

Threading Machine—Four manuals covering the operation and maintenance of portable and stationary threading machines, Nos. 422, 502, 562 and 300, respectively, have been issued by Oster Manufacturing Co., E. 61st at Carnegie Ave., Cleveland, Ohio.

Water Pumps—Two methods of pumping water from deep wells—the turbine and hypocycloidal methods—are discussed and cross-sectional views of deep-well pumps and illustrations of various types of pump heads are given in Bulletin 141A by Peerless Pump Co., 301 West Ave. 26, Los Angeles 31, Calif.

CONTROL EQUIPMENT

Colorimeter—General description and main features of the "Lumetron Photoelectric Colorimeter Model 402-E" are given in detail in a 14-page manual published by Photovolt Corp., 95 Madison Ave., New York 16.

pH Equipment—A portable universal pH indicator with glass, hydrogen and quinhydrogen electrodes, for laboratory and plant use in making accurate and direct readings of samples between 2 and 40 c.c. at temperatures from 0 to 50 deg. C., is described and illustrated in Catalog E-96(3) by Leeds & Northrup Co., 4907 Stenton Ave., Philadelphia 44, Pa.

MISCELLANEOUS

Display Guide—A wide range of ideas for simpler wartime window displays through the use of color corrugated cardboard is illustrated in a 16-page booklet published by Sherman Paper Products Corp., Newton Upper Falls, Mass.

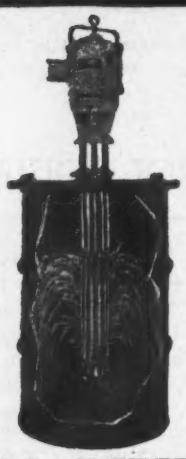
Electronics—A 24-page nontechnical booklet entitled "How Electric Tubes Work," GEA-4116, describes and illustrates by 117 sketches the eight basic types of industrial electronic tubes and their uses; issued by General Electric Co., Department 6-215, Publicity Division, Schenectady, N. Y.

Inert Gases—Elimination of explosion hazards in manufacturing industries using inert gases, such as food processing plants, oil refineries, chemical plants and rubber mills, is discussed in an 8-page catalog, Bulletin 100-B14, issued by Roots-Connersville Blower Corp., Connersville, Ind.

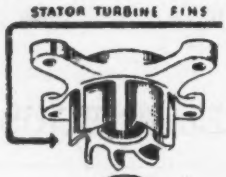
Postwar Planning—Seven immediate benefits and six future benefits by planning postwar operations now are enumerated in the 24-page booklet entitled "Are You Over-Looking Anything in Your Post War Planning?" issued by Alfred J. Silberstein, Inc., 9 E. 40th St., New York 16.

Sanitation and Maintenance—Ninety-seven essential wartime sanitation technics and maintenance procedures to prevent spoilage loss, facilitate quality control, conserve manpower, lengthen equipment life and cut down costs are described in detail in a 24-page catalog put out by Oakite Products, Inc., 26 G Thames St., New York, 6.

S-T-R-E-T-C-H
Man Hours



WITH
HOMO-MIXER'S
ADVANCED PRINCIPLE



INDUSTRY must win the race against time! But more than a great time-saver is the Eppenbach HOMO-MIXER. It's also engineered for finer diffusion.

Its principle is wholly different. There is no vortex, no air to affect the mixture. Only a fraction of the mass is worked at one time, creating more uniform dispersion. The material is rapidly forced up from the air-free bottom by the stationary turbine fins. With tremendous pressure and turbulence, the flow surges upward, outward and down. The entire batch completes this cycle in just a minute or two. No clamping to tank, no setting at angle, no vibration.

HOMO-MIXERS are doing a big job in process plants today — batteries up to a hundred! Write us!

EPPENBACH
INCORPORATED
Processing Equipment for Over 30 Years
44-02 11th STREET
LONG ISLAND CITY, N. Y.

BOOKS

Employee Benefits

PENSION, BONUS AND PROFIT-SHARING PLANS. By Esmond B. Gardner and G. Jerome Weber. Published by The Chase National Bank, 18 Pine St., New York, N. Y. 1943. 92 pages; 8x11 in.; paper. Free.

Here is some help on phases of employee relations about which not too much information is readily available to managers of small plants. The authors, who have had years of practical experience in handling pension, bonus and profit-sharing matters in the trust department of a large bank, and who have conducted extensive research into these subjects, present their knowledge in a comprehensive and highly readable form. Their study is designed to assist business executives, industrial relations counsellors and others interested in employee-benefit programs.

The book tells how a pension plan may be financed by investment in annuity contracts or in securities and explains the differences between these two methods. It summarizes the possible provisions covering employee membership in pension plans, benefits accruing from such plans and methods of administration. It also discusses actuarial factors, operating costs and investment considerations, as well as deferred compensation plans of the bonus or profit-sharing type.

Electrical Maintenance

HOW TO MAINTAIN ELECTRIC EQUIPMENT IN INDUSTRY. Published by General Electric Co., Schenectady, N. Y., 1943. 372 pages; 8½x11 in.; cloth. Price $1.75.

Written in the language of the maintenance man, this manual is a tool that can be put to practical application in every factory. Its purpose is to help industrial plants get maximum performance, and longest life out of their equipment through proper upkeep, with special emphasis on maintenance practices which prevent trouble through scheduled inspection and care. Nearly every section opens with a preventive maintenance inspection schedule and closes with a trouble-shooting chart, the latter being extremely helpful to maintenance men who are not experts on electrical apparatus. Photographs and drawings illustrate many of the instructions given in the text.

The various sections of the book give maintenance instructions for all types of electrical equipment used in the plant. And of particular interest to food manufacturers are the sections on battery trucks, industrial control, instruments, insulation, lighting, motors and generators, regulators and switchgear.

There is also a section of technical data which contains, in addition to tables, an explanation of the treatment for electrical shock.

The publisher of this book aims it specifically at the users of its equipment, but the instructions for the most part apply also to equipment made by other manufacturers.

Biochemistry of Fats

BIOCHEMISTRY OF THE FATTY ACIDS AND THEIR COMPOUNDS, THE LIPIDS. By W. R. Bloor. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y., 1943. 387 pages; 6x9½ in.; cloth. Price, $6.

Published as part of the American Chemical Society Monograph series, this book is of timely significance to biochemists in the food field. Its significance lies in the fact that the fats, or more specifically the fatty acids and their compounds, are just now receiving the attention which earlier has been accorded proteins and carbohydrates.

In the words of the author, this book is an attempt to gather together and evaluate the facts which have been reported on the biochemistry of fats so that these data may serve as a background for future effort. It is conceded that a clear picture of the various aspects of the field is not possible at the present time, but it is hoped that the book will make such a picture possible as new facts appear.

The book is divided into six chapters: Chemistry; digestion and absorption; lipids of the blood; lipids in tissue; lipid metabolism; and the lipids of secretions and excretions.

Truck Maintenance

COOLING SYSTEM: CLEANING, FLUSHING, RUST PREVENTION AND ANTIFREEZE. Prepared by Society of Automotive Engineers, Inc., and published by Office of Defense Transportation, Washington, D. C. 1943. 26 pages; 9x11¾ in.; paper. Free.

As a means of helping operators of motor vehicles to keep their equipment in service for the duration, ODT has issued a pamphlet giving complete and detailed instructions for preparing cooling systems for the winter months. Placed in the hands of the garage foreman, this publication will be of practical assistance in the inspection and testing of cooling systems for losses, in routine maintenance of the cooling system, in diagnosis of overheating and overcooling and in preventing corrosion and avoiding clogging. The pamphlet also gives the characteristics of the different types of antifreeze.

LETTERS TO THE EDITOR

New Development in Technic of Blanching

To the Editor
of Food Industries:

Steam blanching of vegetables prior to dehydration has been done heretofore either substantially at atmospheric pressure or in retorts under pressure but with very little, if any, positive arrangement for assuring uniform treatment of the product. In either case, heat transfer from the steam to the product has been somewhat haphazard, and the blanching equipment required, even in a plant of moderate capacity, has been large and expensive because it was necessary to spread the material in a relatively thin layer.

I have found that by forcing steam to pass through a bed of the cut material the heat transfer rate can be substantially increased, and entrapped air driven out positively, so that blanching may be done successfully in a very thick bed. In preliminary experiments beds of ⅜-in. carrot and white potato cubes from 12 to 18 in. deep have been blanched by supplying steam at the bottom of the bed through a perforated or wire-mesh support. For a period ranging from 40 to 100 seconds the steam supplied is completely condensed by the cold product, even though it is being supplied under a pressure of 7 to 11 in. of water and probably at a rate of 9 to 10 lb. of steam per minute per square foot of bed cross section. The steam flow may be reduced greatly when the hot zone reaches the top of the bed and steam starts coming through. If the blanching is then continued for the normal length of time, there is relatively little difference in the degree of treatment received by the material on the bottom and that at the top. In the experiments referred to there was no evidence of mashing or damage of the bottom layer because of the weight of material above it.

If a blancher were constructed to handle a bed of material at least a foot thick instead of the more usual ¾ to 1 in., the size of a blancher required to handle a given tonnage would be reduced drastically. For example, a continuous rotary type occupying space only 6 ft. in diameter might handle the entire input to a 100-ton plant. Several different types of continuous blancher adaptable to through-flow steam come to mind at once. The flow of steam might be upward, or downward, or sidewise through the bed, depending upon the design.

In view of the unsatisfactory results

THAT's where the Wyandotte Representative has the answers to problems of food equipment cleaning . . . answers he's always ready to pass on to you. And backing him up is the *full* line of Wyandotte Products . . . fit for any job whether it be midget or mammoth.

Wyandotte Products are compounded to make the hardest water cry uncle, and the most stubborn lime scale yell quits. With decades of experience behind them in solving cleaning problems of food utensils and equipment, Wyandotte cleaners are "naturals" for any task you may have. Germicides, too, a *must* to food industries sanitation, help wage Wyandotte's war on bacteria by digging in *after* cleaning.

Maintenance cleaners round out the picture . . . with Wyandotte Products available for cleaning floors, walls, lavatories, wood, metal and composition surfaces. Don't hesitate to call in the Wyandotte Representative on your problems. His know-how packs the weight of many years' experience and specialized training. And he's always on call.

Wyandotte

SERVICE REPRESENTATIVES IN 88 CITIES

WYANDOTTE CHEMICALS CORPORATION • J. B. FORD DIVISION, WYANDOTTE, MICHIGAN

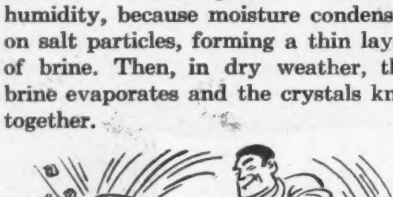
Wyandotte Chemicals Corporation consolidates the resources and facilities of Michigan Alkali Company and The J. B. Ford Company to better serve the nation's war and post-war needs.

OUR SALT carries an umbrella!

Know why an Englishman carries an umbrella? To *keep dry*, of course . . . and today we've developed a practical "umbrella" for Diamond Crystal Salt —to help keep it dry and prevent caking.

Salt cakes when exposed to excessive humidity, because moisture condenses on salt particles, forming a thin layer of brine. Then, in dry weather, the brine evaporates and the crystals knit together.

Our research laboratory has found a number of ways to help prevent salt caking. Removal of moisture-attracting impurities, such as calcium chloride, helps. So does complete removal of fines by careful screening. Most important is to provide salt with a moisture-vapor-resistant package to keep out dampness.



Take our Flour Salt bag, for example. It is composed of three 50-lb. sheets of kraft and two 25-lb. sheets of kraft, laminated together with 40 lbs. of asphalt per ream. That's a lot of asphalt, and it costs us more money—but our moisture-vapor transmission tests show that this bag is well worth the extra cost. The bag is even sewn with *waxed thread* to seal the holes made by the sewing-machine needle. That's *real protection*—one reason we have been able to eliminate caking as a major problem!

NEED HELP? HERE IT IS!

If *you* have a salt problem, write our Director of Technical Service. He will be happy to help! Diamond Crystal Salt, Dept. J-1, St. Clair, Mich.

DIAMOND CRYSTAL
ALBERGER PROCESS **SALT**

reported from many present blanchers it is thought advisable to make this preliminary announcement promptly. Much further work obviously remains to be done on details of the method—

GEORGE T. HEMMETER, *Senior Mechanical Engineer, Western Regional Research Laboratory, Agricultural Research Administration, U. S. Department of Agriculture, Albany, Calif.*

PATENTS

Half Pears Mechanically Freed From Core, Calyx and Stem With Minimum Loss of Fruit Meat—Mark Ewald, Olympia, Wash., to Special Equipment Co., Portland, Ore. No. 2,327,343. Aug. 24, 1943.

Liquid Corn Sirup Converted to Puffed Dehydrated Solid Form—Wilbert A. Heyman, to Granular Foods, Inc., New York, N. Y. No. 2,327,351. Aug. 24, 1943.

Food Packaged in Self-heating Container—Frank J. O'Brien, Pelham, N. Y., to Continental Can Co., Inc., New York, N. Y. No. 2,327,447. Aug. 24, 1943.

Cookies and Like Baked in Band Oven While Passing Through Series of Successive Compartments Heated by Circulating Combustion Products from Exterior Source Moving in Longitudinal Direction and at High Velocity to Cause Transfer of Heat More by Convection Than by Radiation—Kenneth D. Loose, Bronxville, N. Y., and Charles W. Watkins, Dayton, Ohio, to Loose-Wiles Biscuit Co. No. 2,327,727. Aug. 24, 1943.

Vitamin E Prepared in Concentrated Form From Vegetable Oil in High Vacuum—John D. Cawley, to Distillation Products, Inc., Rochester, N. Y. No. 2,327,766. Aug. 24, 1943.

Starch and Like Dried to Give Granular Finished Product—Louis P. Tiers, Wilmette, Ill., to Proctor & Schwartz, Inc., Philadelphia, Pa. No. 2,327,943. Aug. 24, 1943.

Fat-soluble Vitamin-containing Material Treated With Deaerated Activated Carbon in Presence of Heat and Under Reduced Pressure—Loran O. Buxton, Belleville, N. J., to National Oil Products Co., Harrison, N. J. No. 2,328,053. Aug. 31, 1943.

Sausages and Similar Meat Products Bound With Cords Mechanically Applied—Carlo Maccarini, Springfield, Mass. No. 2,328,085. Aug. 31, 1943.

Dextrose or Dextrose-containing Products Made by Acid Conversion of Starch in Presence of Amines—Sidney Mark Cantor, Riverside, Ill., to Corn Products Refining Co., New York, N. Y. No. 2,328,191. Aug. 31, 1943.

Whole Fruit Washed With Borax Water Solution at From 50 to 170 Deg. F., Washed in Cold-water Spray and Surface-dried Preparatory to Juice Extraction—Louis F. Ducker and George A. Little, Orlando, Fla., to Charles H. C. Van Pelt, Amberley Village, Hamilton County, Ohio. No. 2,328,265. Aug. 31, 1943.

Sugar Crystals and Like Removed from Liquid Carrier by Fully Automatic Centrifugal Machine Equipped to Prevent Leakage of Liquid Through Feed Valve During Centrifuging Operation—Jacob J. Neuman, South Salem, N. Y. Nos. 2,328,394, and 2,328,396. Aug. 31, 1943.

Crystalline Sugar and Similar Material Handled in Trough Conveyor Fitted With Tubular Shaft and Hollow Helical Agitator Through Which Flows Heating Fluid—Jacob J. Neuman, South Salem, N. Y. No. 2,328,895. Aug. 31, 1943.

Cut Foods Filled Into Cans and Jars by Machine With Rotary Table Having Filling Openings Around Its Periphery—Roy B. Stover, Toledo, Ohio, and Clarence A. Hoy, Hoopeston, Ill.; Hoy to Food Machinery Corp., San Jose, Calif., and Stover to Owens-Illinois Glass Co. No. 2,328,401. Aug. 31, 1943.

Cone-shaped Coated Frozen Confections Formed by Mechanical Means—Frank Sportolari, Pittsburgh, Pa. No. 2,328,508. Aug. 31, 1943.

Starch Suspension Treated With Small Proportion of Chloride, for Example, Phosphorous Oxychoride, to Form Thick-bodied Product—George E. Felton and Herman H. Schopmeyer, Hammond, Ind., to American Maize-Products Co. No. 2,328,537. Sept. 7, 1943.

Citrus Fruit Treated to Give Product Having Intercommunicating Cells of Citrus Fruit Solids and Corn Sirup—Wilbert A. Heyman, to Granular Foods, Inc., New York, N. Y. No. 2,328,554. Sept. 7, 1943.

Poultry Mechanically Freed From Feathers While Suspended From Overhead Conveyor—Set S. Barker, Ottumwa, Ia. No. 2,328,770. Sept. 7, 1943.

Chocolate Mixture Made to Contain Not Less Than 8 Percent of Sweetening Material as Fine, Dried Particles of Starch Conversion Sirup Solids—Richard C. Drury, Skokie, Ill., to American Maize-Products Co. No. 2,328,791. Sept. 7, 1943.

Soybeans Treated to Increase Palatability and Digestibility by Parboiling in Dilute Solution of Sodium Bicarbonate, Washing in Cool Water, Soaking in Dilute Solution of Ammonium Bicarbonate Under Pressure, and Drying Under Atmospheric Pressure at 212 Deg. F. Preliminary to Heating at 220 to 320 Deg. F. in Hot Oil Bath—Charles A. Raymond, Marion, Ohio. No. 2,329,080. Sept. 7, 1943.

Poultry Quick Frozen by Subjecting Fresh Killed Bird to Refrigerating Spray at 20 to 30 Deg. F. to Reduce Body Temperature to Below 50 Deg. F. Until Rigor Mortis Has Passed Preparatory to Direct Contact with Spray of Refrigerated Brine—Earl Stafford, Reading, Mass., and Charles Hunt Welling, New Canaan, Conn., to Z. Pack Corp., Boston, Mass. No. 2,329,226. Sept. 14, 1943.

Bottled Carbonated Beverages Mechanically Vibrated to Cause Sweeping Out of Air in Head Space by Liberated Carbon Dioxide Preparatory to Sealing—Robert J. Stewart, to Crown Cork & Seal Co., Inc., Baltimore, Md. No. 2,329,304. Sept. 14, 1943.

Cereal Grains Freed From Outer Skin by Agglomerating and Flotation Procedures—Leland H. Logue, Denver, Colo., to Mining Process and Patent Co., Denver, Colo. Nos. 2,329,402. and 2,329,403. Sept. 14, 1943.

Cheese Coated With Wax-like Preparation Comprised of Petroleum Wax and Rubber Halide—James D. Ingle and Leon D. Mink, to Industrial Patents Corp., Chicago, Ill. No. 2,329,470. Sept. 14, 1943.

Foods for Freezer Storage Coated With Glaze Containing Bentonite, Fuller's Earth, Silicia Gel, Chalk, Carbon B'ack, Kaolin and Clay—Carl H. Koonz, to Industrial Patents Corp., Chicago, Ill. No. 2,329,472. Sept. 14, 1943.

Fermented Cereal Beverage Made to Have Chill Proof and Enzymically Active Properties—Harry G. Atwood, Peoria, Ill. No. 2,329,509. Sept. 14, 1943.

Yellow Rind Fruit Given Glossy Protective Coating With Waxy Material Tinted to Avoid Lowering of Color Grade—Charles D. Cothran, Pomona, Calif., to Brogdex Co. No. 2,329,513. Sept. 14, 1943.

Peeled Citrus Fruits Given Surface Wiping by Mechanical Means—Ralph Polk, Sr., Miami, Fla., to Polk Development Co., Tampa, Fla. No. 2,329,555. Sept. 14, 1943.

Green Corn Mechanically Husked in Self Feeding Unit—Charles E. Kerr, Hoopeston, Ill., to Food Machinery Corp., San Jose, Calif. No. 2,329,768. Sept. 21, 1943.

Maturity of Corn Measured by Refractive Index of Juice—Robert E. Oltman, to Minnesota Valley Canning Co., Le Sueur, Minn. No. 2,329,936. Sept. 21, 1943.

Food-containing Cartons Wax Closed and Sealed by Sprinkling With Excess of Molten Wax During Continuous Rotation About Longitudinal Axis in Horizontal Plane—Thomas R. James, Minneapolis, Minn., to General Mills, Inc. No. 2,330,124. Sept. 21, 1943.

Egg Meats Freed From Chalaza and Shell Fragments During Passage Through Cylinder Having Slotted Walls Kept Free From Clogging by Wiper Traveling Lengthwise of Slots Along Surface of Cylinder—James Milton Hansen, Park Ridge, Ill. No. 2,330,422. Sept. 28, 1943.

Chewing Gum Made to Contain Activated Carbon—Clarence H. Flint, Westport, Conn., to Peter Paul, Inc., Naugatuck, Conn. No. 2,330,571. Sept. 28, 1943.

Edible Nuts Washed and Steamed by Mechanical Means—Leo J. Meyer, to Champion Pecan Machine Co., San Antonio, Tex. No. 2,330,605. Sept. 28, 1943.

Confections Formed in Molds Attached to Continuous Conveyor and Having Perforated Bottoms; Closed During Filling by Resilient Pads Attached to Second Continuous Endless Conveyor Operating Co-actively With First—Richard Schoenfeld and Hermann Fiedler, Dresden, Germany, to Alien Property Custodian. No. 2,330,630. Sept. 28, 1943.

Oxidizable Liquid Foods, Filled Into Containers Under Nonoxidizing Conditions—Ronald B. McKinnis, to McKinnis Foods, Winter Haven, Fla. No. 2,330,726. Sept. 28, 1943.

Foam on Liquid in Containers Subjected to Surface Heating to Expand and Burst Foam Bubbles Thereby Reducing Air Content in Head Space of Container and Preventing Spilling Over of Foam—Benjamin F. Batcheler, Maywood, and Rolf L. Peterson, Evanston, Ill., to American Can Co., New York, N. Y. No. 2,330,805. Oct. 5, 1943.

Beverage Constituents Consisting of Coffee, Sugar and Cream Packaged in Composite Container in Dried and Compressed State, Separated From Each Other by Membrane of Filter Material and Enclosed in Rigid Self-sustaining Shell—Henry A. Harriman, Carnegie, Pa. No. 2,330,884. Oct. 5, 1943.

Liquid Foods Heat Treated in Casing-type Unit Fitted With Automatically Operated Inlet and Outlet Valves Under Automatic Time and Temperature Control—Harry L. Griffin, Rockville Centre, and Alexander R. Robb, Valley Stream, N. Y., and Rolla W. Titus and Hans T. Gebbardt, Marysville, Ohio, to Nestle's Milk Products, Inc., New York, N. Y. No. 2,330,967. Oct. 5, 1943.

Foods Preserved in Transit By Shipment in Vehicle Equipped With Ozone Generating Unit—Franklin S. Smith, New Haven, Conn. No. 2,331,147. Oct. 5, 1943.

Meat Products Frozen in Vats Equipped With Return Outlet Near Bottom Thawed by Subjection to Overhead Spray of Pipes Maintained at Predetermined Height Above Floor—Fred Warren Goldthwait, Melrose, Mass. No. 2,331,184. Oct. 5, 1943.

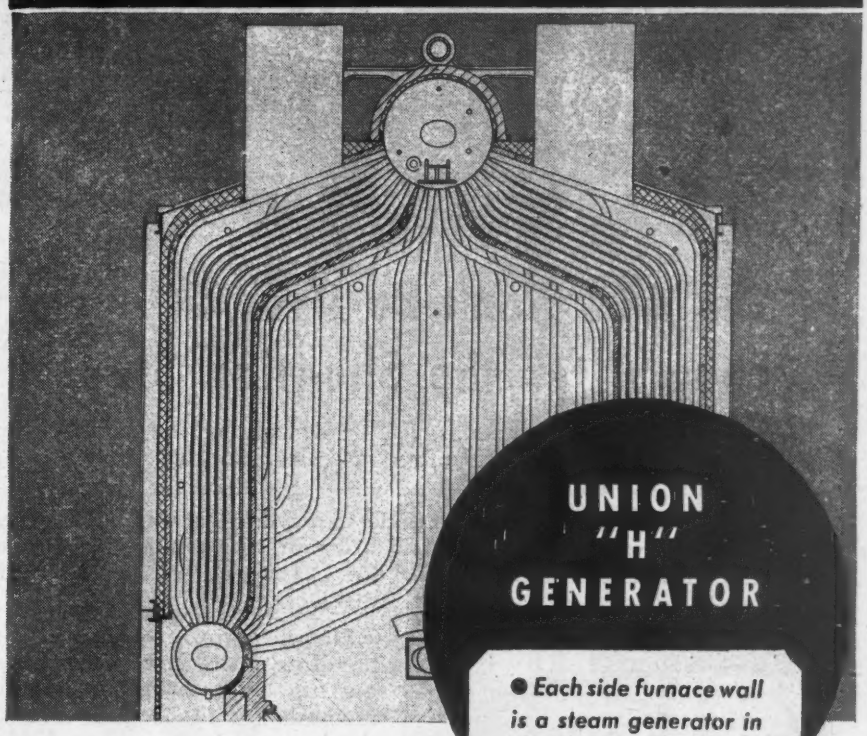
Canadian Patents

Rennet Recovered From Salt Solution Extract With pH Between 4.6 and 7.0 by Treatment With Acids or Acid Salts to Give pH of Less Than 3.6, Followed by Separating Precipitated Solids From Liquid Components—Basil Duperier Thornley and Stanley Hilton, Wilmslow, Cheshire, England, to Benger's Food Ltd, Holmes Chapel. No. 415,003. Sept. 7, 1943.

Wheat Tempered for Moisture Content Preliminary to Milling Under Controlled Flow Through Treating Drum Where Subjected to Temperature-controlled Water Spray and Subsequent Surface Air Drier—Percy W. Thomas, Wichita, Kans. No. 415,140. Sept. 14, 1943.

Soya Oil Freed From Reversion Constituents by Selective Hydrogenation Under Specifically Controlled Conditions—Harland H. Young and Howard C. Black, to Industrial Patents Corp., Chicago, Ill. No. 415,318. Sept. 21, 1943.

UNION



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But the food industry must continue to produce its utmost for years to come—until vast regions desolated by war or stripped by a greedy foe can be nursed back into full production.

Two-plane chain conveyor and telescoping gravity unit bring top efficiency to cooling room of Syracuse Guernsey Dairy Co-operative.

No one in the food business, now handling increased volume, need put up with obsolete handling methods on the supposition that the increase is temporary. Lamson invites you to send for illustrated literature, showing Lamson conveyors at work, and to consider the savings in money, time and manpower, and the increase in efficiency that can be achieved with up-to-date materials-handling equipment.

No congestion in this egg-room at Safeway Stores, Los Angeles. Egg packers receive empty cartons by conveyor. Return belt of same conveyor takes filled cartons to storage.

Faster assembly of orders is accomplished with less labor in this warehouse by using a Lamson overhead conveyor to haul the trucks. Safeway Stores, Oakland.

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Makers of CONVEYORS and PNEUMATIC DISPATCH TUBES

Quick Freezing Mushrooms

(*Continued from page 75*)

ing the blanching process. There was very little loss of riboflavin. All three of these vitamins are quite stable during storage for five months, at the end of which time the experiment had to be terminated.

Quick Frozen Mushrooms

Preparation of Material—Fresh commercially grown mushrooms were thoroughly washed in cold water. Experimental lots of the fresh material were treated as follows prior to freezing:

1. Unblanched, no treatment.
2. Blanched in steam.
3. Five-minute dip in 1 percent citric acid solution and blanched.
4. Five-minute dip in 2 percent citric acid solution and blanched.
5. Five-minute dip in 3 percent citric acid solution and blanched.
6. Five-minute dip in 2 percent sodium chloride solution and blanched.

All of the above methods were used with both cut and whole mushrooms. The cut pieces and button mushrooms were blanched for 2 minutes and 15 seconds, and the medium- and large-sized whole mushrooms for 3½ minutes, in steam. These blanching times were sufficient to inactivate catalase in the material used. Immediately after blanching the mushrooms were cooled in cold water, drained and packaged for freezing.

The blanched mushrooms were packaged in moistureproof cellophane bags which were heat sealed. The packaged mushrooms were frozen at a temperature of −10 deg. F. in a quick freezing cabinet equipped with a fan. The frozen products were stored at −5 deg. F. in a freezing cabinet. Changes in the quality of the frozen mushrooms were followed during a storage period of three months' duration.

Results—The mushrooms which had been blanched were superior in appearance and were lighter in color than the unblanched samples. However, there was a slight amount of darkening in all cases. The unblanched frozen mushrooms continued to darken during storage, and an orange discoloration appeared in them which was apparently due to enzyme action.

After three months' storage, samples of the frozen mushrooms were boiled in a small amount of water until they were completely cooked. The blanched mushrooms retained their flavor remarkably well during storage. However, the unblanched mushrooms lost most of their flavor. There was little difference in the flavor of the different lots of blanched mushrooms except those given

the 3 percent citric acid dip, and they had a definitely sour taste. The procedure of dipping the mushrooms in a 1 or 2 percent citric acid solution prior to blanching improved the appearance of the frozen product and did not adversely affect the flavor.

Vitamin Stability—During the study on the freezing of mushrooms some data on their thiamine, riboflavin, and nicotinic acid content were obtained. This phase of the investigation was confined to those mushrooms which had been blanched but not given any additional treatment. The methods of vitamin assay employed were the same as those described above under dehydrated mushrooms. The results of these tests are summarized in Table III. From these data it may be seen that there was a slight loss of riboflavin and some loss of thiamine and nicotinic acid during the blanching of mushrooms prior to freezing, but that all of these vitamins are quite stable in the frozen product.

Summary

Commercially grown mushrooms (*Agaricus campestris*) can be dehydrated so that on reconstitution and cooking they will compare favorably in flavor and appearance with fresh mushrooms. For dehydration it is recommended that the mushrooms be thoroughly cleaned in cold water, cut into pieces, blanched in steam for 2 minutes and 15 seconds and dried at a temperature of 145 to 150 deg. F. to a moisture content of 5 percent or below. The dehydrated mushrooms should be packaged in moistureproof containers. For optimum retention of flavor, this product should be stored at a temperature of 75 deg. F. or lower.

Fresh mushrooms are a very good source of riboflavin and nicotinic acid. The thiamine, riboflavin and nicotinic acid contents of mushrooms are quite stable during dehydration and storage of the dried product.

The quick freezing of mushrooms was found to yield a satisfactory and flavorful product in which thiamine, riboflavin and nicotinic acid were well retained.

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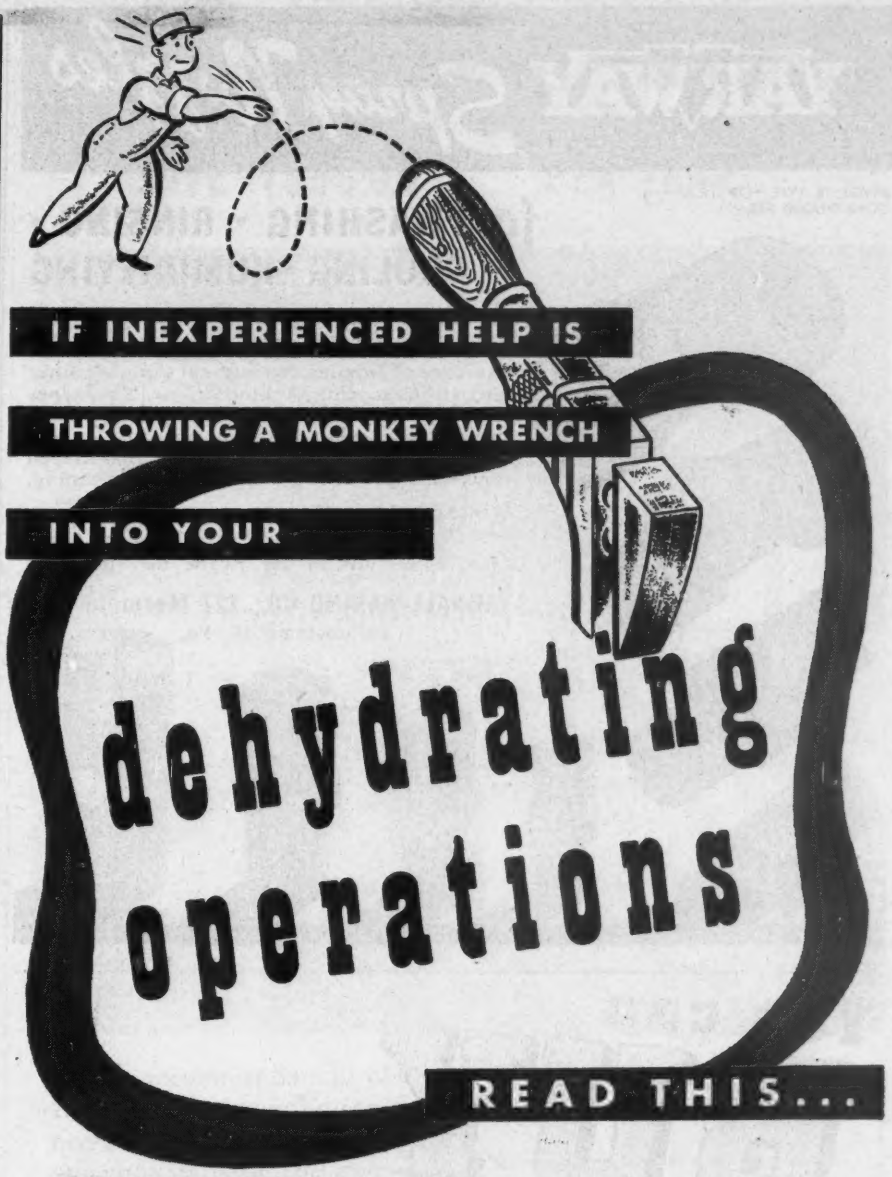

The dehydration of foods has presented many new problems . . . often complicated by the lack of experienced workers. Of major importance, for example, are the problems of sanitation. Off-tastes, off-flavors, spoilage are a constant threat . . . unless rigorous measures are effectively employed.

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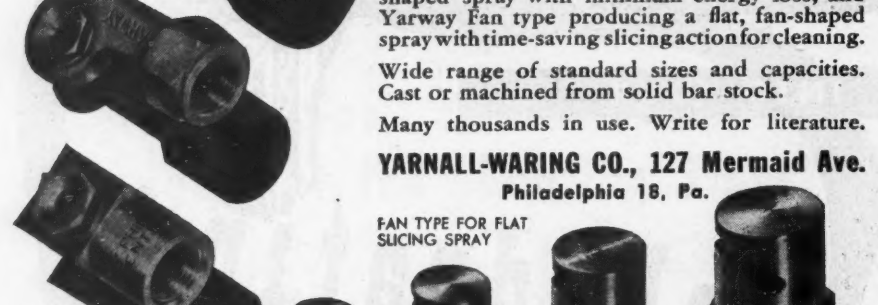

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Uses New Technics

(*Continued from page 63*)

Trays not meeting government standards are returned to the tunnels for further drying.

Sticking of the dried product to the trays is a bugbear with many products. But in potato drying as conducted by Simplot, it seems to be inconsequential. When trays are stood on edge at the two dumping hoppers most of the contents fall away. Then the two men who dump the trays scrape them with dull steel hoes having blades 12 in. wide and 1½ in. high on 18-in. handles. The trays come away clean except for a little starch.

As trays return from the dumping stations, they are fed onto a conveyor that carries them under a spray to soften any starch and then under a revolving brush and spray, the movements of which are suggestive of the mechanically operated brushes used in breweries for external washing of beer kegs. This insures cleanliness, and no

criticism can be made of these trays from the sanitation angle.

From the dumping hoppers the product moves upward on an elevator to two bins that feed two 3x25-ft. final inspection tables. Here crews of inspectors remove any off-color or hollow-heart potato strips missed by previous inspections. This work is done under fluorescent lighting, the white light of which is most effective in bringing out true colors and ensuring accurate inspection.

From the inspection tables, the finished product is elevated 14 ft. to a bin that feeds an automatic weigher. This device dumps a net 15 lb. of dehydrated potatoes into fiberboard containers on the automatic vibrator. The package then goes to the check-weight scales, is tape-sealed and put into a lead-foil bag on tables and then is passed through a heat-sealer. Now it is put into another fiberboard container which is glue-sealed and stenciled. Two of these packages are placed in a wooden box, nailed, strapped, stenciled and labeled, ready for shipment to our armed forces all over the world.

A completely equipped and efficiently staffed laboratory is an important part of the Simplot operation. Here moisture, enzyme and bacteria tests are constantly conducted. Continuous government inspections are also made independently of the plant laboratory, the one serving as a check on the other, and both assuring a quality product and a sanitary plant.

Researches in the fields of vitamins and starches to determine losses through dehydration and methods of recovery are also being conducted.

Accessory Equipment

When it became necessary to abandon 5-gal. tin containers and change to fiberboard and wood, Simplot had difficulty in obtaining an adequate supply of boxes. So he installed his own box factory adjacent to the dehydrater.

Also an important part of the Simplot operation is a complete machine shop. Practically every unit in the line has been built on the grounds to original specifications. Many were unheard of before this plant began, having evolved during the almost continual improvement and expansion that has characterized this food processing organization.

Steam for the scalding and blanching processes is furnished by three boilers, with a total of 750 hp.

The Future

Jack Simplot isn't worrying about the future. Right now his job is to turn out as much dehydrated potatoes and onions as he can for the United Nation's armed forces. He has a contract from the government for the production of 20,000,000 lb. of dried potatoes during

Baker Truck HELPS WAREHOUSE

SAVE $7956.00 PER YEAR

On the recommendations of a Baker material handling engineer, a large midwest grocery warehouse made the investment outlined at the right. Enough time has passed since the installation to compute actual savings.

In addition to the money earned, this equipment reduced handling time, conserved man power, cut rent cost by higher tiering, and minimized damage to cartons. Start planning now with Baker's help so that you can realize similar advantages.

FACTS AND FIGURES

★ **Subject**—Large grocery warehouse

★ **Investment**—Baker Hy-Lift Truck and conveyor system

★ **Total Cost**—$16,375.25

★ **Operating Cost**—
Prior to investment—$0.668 per ton
After investment —$0.498 per ton

★ **Reduction**—$0.17 per ton, or 25.4%

★ **Tons Handled**—Average 900 per week

★ **Gross Savings**—$153.00 per week
$7956.00 per year

These figures show how a capital investment of $16,375.25, written off completely in five years, earned from $4680 net profit the first year to $7596 the fifth and each year thereafter.

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Baker INDUSTRIAL TRUCKS

the 1943-44 season, and will dehydrate at least as many onions as last season and probably more. Dried onion production from the plant reached 1,000,000 lb. last season. This was under a plant situation that made it necessary to shut down on onions when potato dehydration started. It is now possible to turn out both simultaneously.

After the war . . .? That is another story that Mr. Simplot promises to give FOOD INDUSTRIES when that time comes.

Vitamin-Rich Food

(*Continued from page 69*)

are not known.) Exit air at a temperature of 165 deg. F. passes through a cyclone collector and thence to a stocking collector, where the last particles of dried yeast are removed.

Sprays are produced by Merril-Soulc nozzles purchased from Borden Machine Co. The liquid yeast, of creamy consistency, is pumped through the spray nozzles by a motor-driven triplex pump at 1,500-lb. pressure.

After the funnel was added at the head end, drying was satisfactory, but the amount of dry powder that carried over into the cyclone and stocking collectors was too great for efficient operation. This led to an experiment that proved successful. Another blower delivering 900 cu.ft. per minute of 300-deg.-F. air was placed at the exit end to blow air against the oncoming blast form the main blower. The back pressure actually produces a static zone near the midpoint of the tunnel and causes most of the product to drop into the hopper bottom. Only a relatively small amount of powder is carried over to the secondary collectors.

An observer inside the dryer with blowers going, but no heat, has felt almost no air movement at the midpoint, yet actual drying operations are not interfered with by the "back draft."

Production Figures

This equipment, assembled from miscellaneous sources without the aid of many priorities, and to a large extent home-made, has a capacity of 500 lb. of dry yeast in 6 hours. For easy figuring, for each barrel of beer brewed there is produced about 6 lb. of wet yeast, or 0.6 lb. of dried yeast.

When additional yeast separators are available the time of goods in process will be shortened—there are now three passes through one separator. Priorities for additional equipment have been assured. Yeast from other breweries in the Boston area, where there is now available about 20,000 bbl. of liquid yeast annually, will be collected when the new equipment can be made ready to handle it. A 2,700-gal. tank truck for this purpose is itself an example of the ingenuity used in making equipment for the process. It was constructed by installing an unused glass-lined tank on a second-hand truck.

The finished yeast product, a bland powder, has been mixed successfully with dry soups, bread, peanut butter, cheese, chocolate pudding, cocoa, candy bars, biscuits, and other products. The uses are almost unlimited. Due to the extreme mildness of flavor its presence cannot be detected.

Brine-Salted Mullet

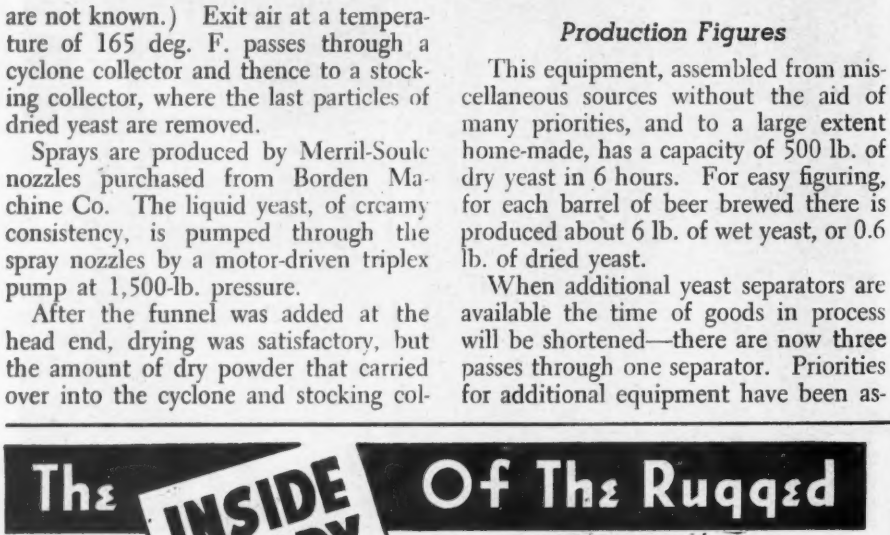
(*Continued from page 71*)

of mined or purified salt in the packing process will lessen the danger of spoilage from this cause.

Dried and Smoked Roe

The preparation of dried and smoked mullet roe may be a profitable byproduct when preserving mullet. Although roe as a food may not be considered an

The INSIDE STORY Of The Rugged



Viking HEAVY DUTY PUMP

The sturdy yet simple construction of the Viking Heavy-Duty Pump is graphically shown in the cut-away view above. It illustrates clearly the inside story of this unit—designed and built for long hard service.

You will note there are no small, intricate parts to wear and get out of adjustment. The pumping members are the standard Viking "gear within a gear," with only two moving parts. Available in sizes of 200, 300, 450, 750 and 1050 GPM.

Write today for free copy of Bulletin 2900. It will give you the complete story of Viking Heavy-Duty Pumps, including specifications and complete data on operation, lubrication and maintenance.

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everyday essential, it often finds a good market as a specialty product.

The roe, averaging ¼ lb. each, are carefully removed. In dressing the fish, special care is exercised not to cut the roe membrane. The roe are placed in a crock after careful washing and cleaning, and salted layer on layer with a finely ground salt. After ½ hour the roe are removed from the crock, the salt washed off in cold, fresh water, and the roe placed on a flat-top table in the open room to dry. For two days the roe are left on the table and are turned every few hours to insure even drying. When the roe are firm enough to be handled, strings are attached to each pair through a small hole punched near the top joint of the pair. Then they are hung from sticks in the open room and allowed to dry for several days more. The roe are considered sufficiently dry when pressing between two fingers leaves no noticeable indentation.

To preserve the roe and prevent further drying, they are dipped in a 50–50 mixture of paraffin and beeswax. The use of beeswax, alone, is satisfactory. This procedure is simple and is carried out as follows: Equal amounts of paraffin and beeswax are mixed and melted together in a receptacle about 12 in. deep and 6 in. in diameter. The roe, while still attached to the strings, are dipped into the hot mixture and held therein for two or three seconds. After being removed the roe are hung, as before, in the open room to dry.

Smoked roe are prepared similarly, except that they are soaked in a concentrated brine for four to five hours and are then smoked for two to six hours after drying. The use of oak or hickory sawdust is recommended. No wax coating is used for the smoked roe. Roe prepared in this manner may be stored in a cool room, packed in boxes, or wrapped in waxed paper.

Caution must be exercised in preparing fish roe for market, since the roe from certain species are likely to produce gastric upset or even be toxic. The mullet roe has been found to be a satisfactory product.

Brine-salted mullet, when properly prepared and handled, is one of the best of our salt fish and is deserving of more widespread popularity. At this time the major portion of the pack is sold locally in the South and South Central states. In addition to the large existing market in the Caribbean area and South America, there is a large potential market in the Midwest and the Great Lakes area.

The Fish and Wildlife Service urges an increase in the catch of mullet and more widespread use of brine salting to preserve seasonally heavy runs and promote the more general utilization of this valuable food resource of our coastal waters.

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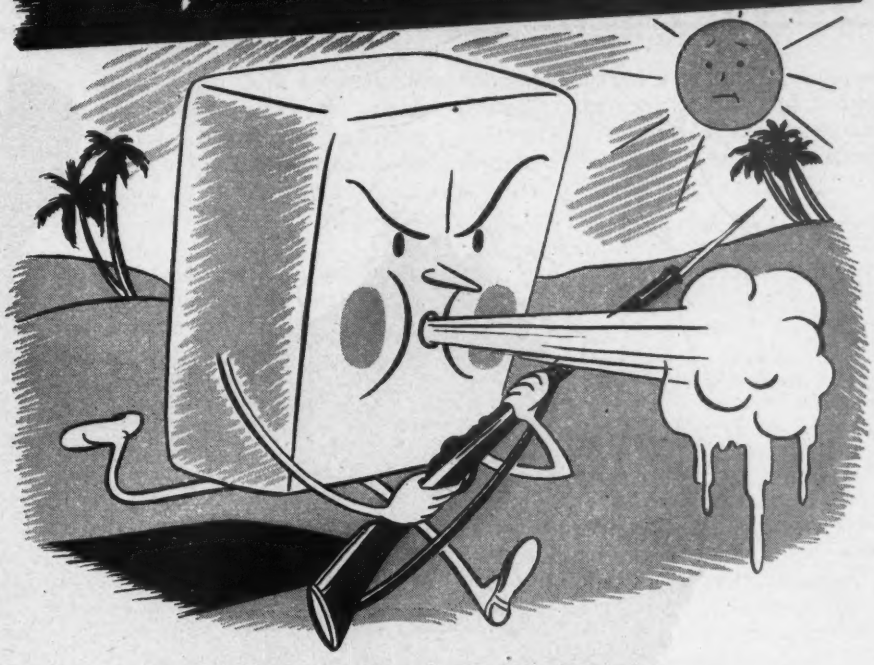

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Wherever food goes—to home front workers and their families, overseas to fighters or to peoples of occupied countries—MECHANICAL REFRIGERATION has played an important role in preserving, processing, storing and delivering it safely . . . performing a wartime service vital to Victory.

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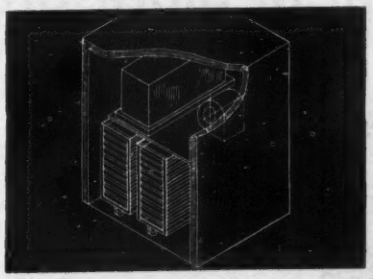

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ROCHE

FOOD TECHNOLOGY

NEW DISCOVERIES AND INVENTIONS

CEREAL PRODUCTS

Vitamin Increase in Sprouting of Grains

INCREASE in the amounts of B-complex vitamins during sprouting of grains was determined microbiologically in seeds germinated at 85 deg. F. for 5 or 6 days. Sprouted seeds were washed and dehydrated at 158 deg. F. before analysis. Results included the following, reported in milligrams per 100 grams of dried matter:

	Thiamine	Riboflavin	Niacin
Oats	1.13	0.68	0.75
Oat sprouts...	1.22	1.16	4.40
Wheat	0.70	0.13	0.54
Wheat sprouts	0.90	6.20	10.30
Barley	0.68	0.09	6.75
Barley sprouts	0.90	0.72	11.50
Corn	0.55	0.11	0.95
Corn sprouts..	0.51	0.43	3.95

Digest from "B-Vitamins in Sprouted Cereal Grains," Burkholder, Science, vol. 97, 562, June 18, 1943.

The Cereal Amylases

IN a comprehensive review of the cereal amylases, the author emphasizes the differences in function of the two important constituents of barley malt diastase, alpha and beta amylase. Alpha amylase is fundamental in starch modification and degradation, beta amylase serves to supplement its action and to increase the velocity of certain processes. Alpha amylase acts on native starch, liquefies and dextrinizes boiled starch rapidly and completely, and saccharifies boiled starch slowly but with a high ultimate degree of conversion. Beta amylase does not act on native starch, liquefies and dextrinizes boiled starch inefficiently and incompletely, and saccharifies boiled starch rapidly but with a low ultimate degree of conversion.

Ungerminated wheat and rye, like barley, have a high amylase activity, oats are less active, while maize, sorghum, millet and rice show only slight activity. Alpha amylase is present in all these grains, while beta amylase occurs in relatively large quantities in wheat, barley and rye, and to a somewhat less extent in oats. Germination increases the saccharogenic, dextrinogenic and liquefying activities, but the usual methods of measuring saccharifying power give low results for the germinated grains without beta amylase, in spite of their power to bring about a high ultimate degree of conversion to dextrins and fermentable sugars. A determination of alpha amylase activity, by starch liquefying activity or by a specific dextrinization technic, should be included in any malt analysis for correlation with industrial uses.

In an unsupplemented bread dough there is only slow starch degradation due to the action of the beta amylase on the "available" starch (that severely damaged in milling). The supplement of diastase is needed to increase the alpha amylase activity, so as to bring about the degradation of the undamaged starch. The absence of beta amylase in the supplement has no apparent influence, because there is already sufficient beta amylase present to carry on the reaction, once it is started. In this case the Lintner type of determination of "saccharifying power" would not give any indication of the value of the supplement.

Digest from "The Cereal Amylases, Significance of the Component Concept," by E. Kneen, *Wallerstein Laboratories Communications*, vol. 6, 101-110, August, 1943.

QUALITY CONTROL

Microscopic Method Used In Study of Ice Cream

APPLICATION to ice cream of microscopical methods which were developed for petrographic studies yields definite quantitative records of structure and composition.

The method is based on the fact that the crystalline constituents of the ice cream, such as the sugars and ice, can each be identified under plane polarized light by their indices of refraction. Identification depends on the internal structure of the crystal and is independent of its external size or form. By this means it is possible, for instance, to distinguish between alpha and beta lactose and sucrose.

The identity, quantity and grain size of the various constituents are determined without melting the ice cream, adding chemical agents or otherwise introducing variables. A thin section of the frozen product is cut with a razor blade and mounted in a liquid, usually ethyl acetate on account of its index of refraction. A petrographic microsope, or an ordinary laboratory microscope equipped for use of plane polarized light is used. The crystals appear brightly illuminated against a dark background of the noncrystalline materials and isometric crystals. Natural colored or monochrome slides may be made for study and record.

Digest of "Microscopy of Ice Cream with Polarized Light," by W. D. Keller, W. H. E. Reid, W. S. Arbuckle and C. W. Decker, *Journal of Dairy Science*, vol, 26, 683-88, August, 1943.

DAIRY PRODUCTS

Homogenized Milk Tests

A GENERAL survey of the need and methods for laboratory control of homogenized milk includes the recommendation of minor modifications in procedure in order to obtain accurate Babcock fat tests. Acid and milk should both be at room temperature, 17.0 ml. of acid should be used, and the samples should be mixed after the first centrifuging.

For fat tests a siphon opening up is preferred in taking the sample from the bottle. The siphon will give more uniform and reliable results, although the results will be slightly lower than when a pipette is used.

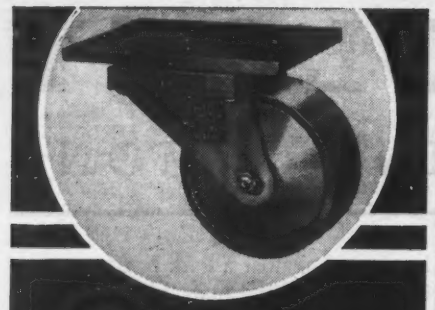
The Farrell index of homogenization efficiency is considered to be very satisfactory.

Digest from "Laboratory Control of Homogenized Milk," by F. J. Doan, Reprint from the *Laboratory Section of the Bulletin Convention of the International Association of Milk Dealers*, April 17, 1943.

Cheese Making

SEVERAL patents have been issued on cheese processing. Ingle uses calcium lactate as an emulsifying agent in making processed cheese. Between one and five percent of the lactate is added during processing and before pasteurizing. He states that the product has a smoother body and texture than when sodium or potassium lactate is used.

Beers incorporates a substantial amount of edible acid, such as lactic acetic or propionic, into the drained curd, so that the pH rapidly reaches a value of 4.8 to 5.2, then he drains the material and processes without further curing. Cheddaring or matting and milling operations in the vat and hooping or bandaging of the cheese are eliminated. The elapsed time from receipt of the whole milk at the cheese factory to packaging is 24 hours or less. The final product may be



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all of this new material, or it may be blended with other cheese, the addition of 15 to 20 percent each of young cheese and aged cheese being given as an example. The processing temperature may be increased to 160 deg. F.

Lane and Hammer add lipolytic enzymes derived from mammary tissue to milk intended for cheese, to speed up the development of flavor and shorten the ripening period. They have found that during ripening a limited breakdown of fat in the cheese is desirable. It is suggested that the butyric acid resulting from the fat hydrolysis is destroyed by microorganisms, while the higher fatty acids accumulate in the fat portion and contribute to the flavor. This flavor development does not occur in cheese made from pasteurized milk, in which the lipase has been destroyed. When relatively large amounts of the mammary tissue or extract are used the cheese becomes slightly rancid in the early stages of ripening, but the rancidity disappears rather quickly.

Fear makes cheese from pasteurized and neutralized milk by adding a lactic acid producing starter made from milk neutralized by calcium or magnesium oxide, pasteurized, and inoculated with a desirable lactic acid producing organism which is permitted to grow until the milk coagulates at an acidity between 0.85 and 1.00 Nafis. Less rennet is required. The process results in firmer but less tough curd and less acid whey and curd cubes. The steps in heating, cheddaring, milling, salting and pressing are to be so standardized as to give a uniform product.

Digest of U. S. Patents 2,317,958, issued April 27, 1943, to J. D. Ingle and assigned to Industrial Patents Corp., Chicago, Ill.; 2,325,217, issued July 27, 1943, to W. O. Beers and assigned to Kraft Cheese Co., Chicago, Ill.; 2,322,148, issued June 15, 1943, to C. B. Lane and B. W. Hammer and assigned to Iowa State College Research Foundation, Ames, Iowa.; and 2,326,133, issued August 10, 1943, to E. D. Fear, Kansas City Mo.

BACTERIOLOGY

Vegetable Peptones As Culture Media

In a study of peptones as components of culture media, samples of commercial and specially prepared peptones were tested for their ability to support growth of several types of organisms. The vegetable peptones were prepared from corn gluten hydrolyzates, from the gluten before hydrolysis, and included also a tryptone prepared by digesting corn gluten with trypsin in the presence of Na_2CO_3. Unpredictable variations in yield of animal peptones from the same source were found, attributed largely to variations during dialysis.

The ability of the various peptones to support growth was measured by the rate of growth of *Escherichia coli*, the plate count of raw milk, the growth and gas production of coliform organisms from naturally contaminated water, and the growth of pathogens.

The data indicate that the value of a peptone depends not so much on the original tissue used in its preparation as on the treatment of the tissue during preparation.

The authors state that although it it doubtful if vegetable peptones will ever be able to replace animal peptones for growth of the more fastidious pathogens, they are to be recommended as a cheap source of nitrogen for growing the more common saprophytic organisms.

The article gives analyses of a large number of commercial peptones, methods of preparation of peptones from animal and from vegetable sources, results of tests on the buffering action, and details of the experiments with various test organisms.

Digest from "Chemical and Bacteriological Studies on Peptones," by A. E. Hook and F. W. Fabian, Michigan State College Agricultural Experiment Station *Technical Bulletin* 185, June, 1943.

PICKLING

Use of Starters in Genuine Dill Pickles

Lactic acid formed during fermentation is the preservative agent in pickles and sauerkraut. A recent patent covers the addition to the brine of a starter solution which increases the rate of acid production to the point where yeasts and pectin-destroying bacteria cannot grow. Effective materials include the steep water from the wet milling of corn, press water from potatoes, extracts from malt sprouts and beans soured during the extraction to increase lactic acid, and certain other waste materials. The increase in the rate of lactic formation is attributed to the presence in these materials of phytin and other compounds of the bios complex. The presence of the amino acids is desirable in furnishing a nutritive medium for the lactic acid forming bacteria and in buffering the acid so that the flavor is improved.

Such starters are better than pure cultures. The same improvement could not be brought about by addition of lactic acid at the beginning of a normal pickle fermentation.

When a yeast growth occurs during the fermentation, lactic acid and sugar are destroyed, and the reduced acidity permits the growth of bacteria which decompose the pectin of the cucumbers, making them slimy and soft. By the

use of the steep-water or other starter solution, the product is kept firm, crisp and of good color.

The steep water from the wet milling of corn is reported to contain 40 to 50 percent of nitrogen-containing substances, calculated as N × 6.25. This includes the amino acids. There are 11 to 15 percent of carbohydrates. Total acids are 12 to 17 percent, calculated as lactic. About 50 percent of the acid present is lactic. The 15 to 18 percent of mineral matter comprises 6 to 9 percent of P_2O_5, 0.3 to 0.6 percent of CaO, 2 to 3 percent of MgO and 4 to 6 percent of K_2O.

For dill pickles, a 23- to 28-deg.-sal. brine can be used, with 1 oz. of steep water per gallon of brine. The barrels can be kept closed during fermentation, due to the absence of gas formation. Acidity in a typical case was 0.7 percent after 4 days, 1.4 percent after 30 days. Without steep water the acidity reached 0.7 percent after 8 days, then declined.

Instead of adding the steep water to the entire batch, a very vigorous fermentation can be started in a small portion of the batch, then these inoculated cucumbers can be evenly distributed among the remainder of the cucumbers to be processed.

In making sauerkraut, the steep water, or other starter solution, is also useful. In this case the solution should be diluted with water, then sprinkled on the salt as each layer is laid down, so that the steep water added amounts to 0.125 to 0.35 percent of the weight of the cabbage.

Digest of U. S. Patent 2,322,880, issued July 29, 1943, to Alfred Pollak, New York, N. Y.

PACKAGING MATERIALS

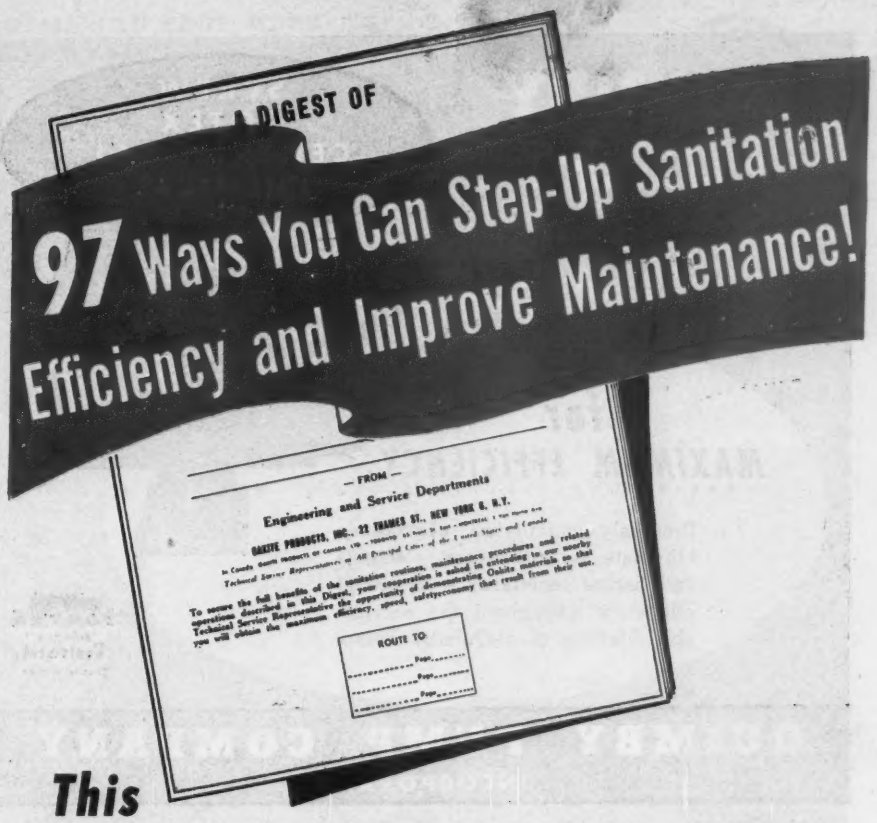
Paperboard Antioxidant

OXIDATIVE deterioration of cardboard, which leads to off-odors and the absorption of those odors into packaged foods, can be prevented, according to a recent patent, by incorporating lecithin in the board.

Starch solution or some other carrier is used. The board is treated so as to incorporate 0.01 to 2 percent of lecithin, then calendered at a temperature above 180 deg. F.

The claims cover only starch-lecithin, but the disclosure suggests other combinations of sugars or water-soluble carbohydrates with various phospholipins, phosphates, polycarboxy and hydroxy aliphatic acids, proteins and amino acids, substituted aromatic compounds, and even blackstrap molasses.

Digest of U. S. Patent 2,324,529, issued July 20, 1943, to S. Musher, New York, N. Y.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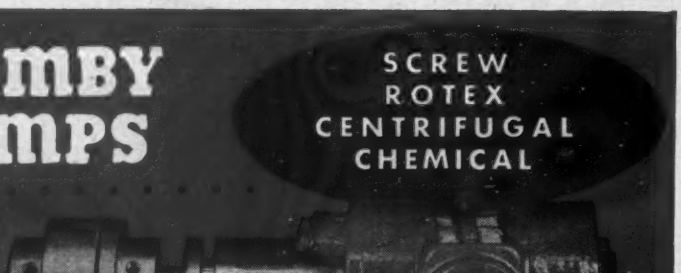

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Questions and Answers

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In Pennsylvania, there are offices in the New Custom House, 2nd and Chestnut Streets, Philadelphia, and the Old Post Office Building, Pittsburgh. The state regulations are under the Director, Bureau of Foods & Chemistry, Department of Agriculture, Harrisburg.

Dog Food Spoilage

New York—"We have been having trouble with spoilage, by souring, of our cooked dog food, sometimes before and sometimes after freezing. The meats and cereals are cooked for about two hours in the temperature range of 160 to 180 deg. F. After this, the food is put into cardboard containers for freezing. The interval from cooker to freezer may run from two to four hours, which means the food is at room temperature during that time. The cases are then placed at zero deg. F., where they remain for at least 10 days. Some of the food has turned sour while still warm from cooking, some after freezing and still more after about 12 hours in a refrigerator at 28 deg. F. We would appreciate any suggestions."

From the information you give, it would seem that the trouble may lie in the cooking operation. Are you sure that the material is cooked to a temperature sufficiently high to pasteurize? Often material will be hot enough on the outside, while the interior still remains quite cool. If tests show that the temperature throughout the batch does actually reach 180 deg. F., it may be necessary to go to a somewhat higher temperature, 190 or 200 deg. F.

Because of the variations in the time when spoilage appears, there may be more than one source of trouble. After you are sure that the cooking has properly sterilized the product, look for possible sources of contamination in handling the cooked material or the cartons while packaging. Also, the time interval

before freezing should be as short as possible, and if it is not possible to freeze promptly, the material should be cooled immediately after cooking. And finally, some of the trouble may lie in the freezing temperature. Cooked meat products require very low freezing and holding temperatures.

Water Supply Problems

Wisconsin—"We are giving some thought to the water problem in several industries where certain types of water, by reason of their hardness, undesirable flavor or lack of uniformity, are a problem to manufacturers. Will you please give us a few viewpoints on these questions, particularly what undesirable qualities of water are most significant in the food industry?"

Naturally, in connection with water, the food industries all desire uncontaminated supplies both for ingredient and sanitary purposes. For this reason care must be taken that the water supply be free from organisms that are harmful either to the consumer or to the product. This, of course, is particularly true of ingredient water, as the water used for sanitary purposes can be made safe by the addition of chlorine or other sterilizing agent.

It is also natural that food manufacturing companies shun the use of ingredient water having undesirable odors or flavors, such as water from mineral wells that has a strong sulphur odor.

Assuming, however, that there is a source of ingredient water that is uncontaminated and has no undesirable flavor or odor, it still may not be suitable for use in the food industries. This is particularly true for hard waters containing relatively large percentages of calcium salt. For instance, such a water is unsuitable for the canning of many tender products such as green peas, because it tends to harden them. It also has other undesirable effects on many other food plant operations. There is an increasing tendency to treat ingredient water of the harder types in such a way as to replace the calcium salts by sodium salts or otherwise remove or decrease the hardness.

Still another objectionable feature is the presence of iron or iron salts, at least in any noticeable quantity. These have, with many foods, the effect of producing off colors or a cloudy appearance. This objection applies particularly in the beverage industry. Should you desire to see the length to which a wide-awake food company goes in obtaining a suitable ingredient water, you should visit some plants making carbonated beverages, where they filter and treat and expose to ultraviolet light, using in all a series of possibly five operations before the water is carbonated.

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. . . . consumer acceptance

A
Second of a series of
CASE HISTORIES
of commercial uses
of CRY★O★VAC

The ATLANTIC COAST FISHERIES CO.

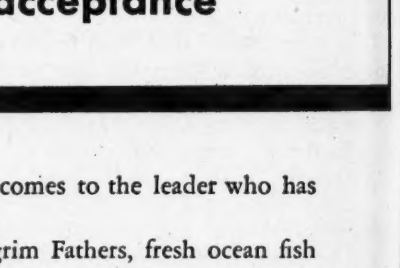
Outstanding success usually comes to the leader who has the vision and courage to try the new.

Even before the landing of the Pilgrim Fathers, fresh ocean fish was one of New England's natural resources. To keep that sea-fresh flavor in a package through the long channels of distribution taxed Yankee ingenuity for years. The solution of this problem was the key to vast new markets in other parts of the country. Modern quick freezing provided only part of the answer.

Daring to pioneer, the Atlantic Coast Fisheries Company put up their first CRY O VAC vacuumized package of fresh frozen fish fillets early in 1941. Would the public like the change to the snug transparent CRY O VAC wrapping? Would it pay just a little more for better fish? Stanley Osborne, Vice President of the Atlantic Coast Fisheries Company, thought it would.

So immediate was the public acceptance of this new package that it was entered in the 1941 All-America Package Competition in a field of twenty thousand packages. Here it was awarded first place in its class by a board of merchandising experts who were quick to appreciate the eye-appeal of CRY O VAC and the long-term protection it afforded against the old dangers of dehydration, contamination, weight loss, rancidity, and odor transfer.

And thus new markets were opened for one of New England's great industries. A fitting reward for the company and the man who dared to pioneer!



ARMY-(E)-NAVY

CRY★O★VAC* a product of
DEWEY AND ALMY CHEMICAL COMPANY
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CRY★O★VAC*— REG. U. S. PAT. OFF. — A PRODUCT AND A PROCESS FOR THE PROTECTION OF QUICK-FROZEN FOODS

FORMULAS FOR FOODS

FORMULA NO. 432

Golden Brown Cake

Cake flour	10 lb.
Sugar	7 lb.
Shortening	4 lb.
Milk solids	1 lb.
Salt	2½ oz.
Baking powder	8 oz.
Soda	2 oz.
Cinnamon	1½ oz.
Water	7½ lb.
Standardized invert sugar	½ lb.
Treacle	6 lb.
Whole eggs	5 lb.

Directions

Blend the flour, sugar, shortening, milk solids, salt, baking powder, soda and cinnamon. Dissolve the treacle and invert sugar in the water, and add to the blended dry ingredients. Mix until smooth. Add the eggs slowly and again mix until smooth.

This may be made up as layers, loaves or cup cakes. Bake at approximately 385 deg. F.

Formula from Nulomoline Co.

FORMULA NO. 433

Stabilized, Homogenized Butter Spreads—II

With Butter

Salted butter	55.5 lb.	45.0 lb.
Cream, 19 percent*	...	45.0 lb.
Skim milk	35.0 lb.	...
Skim milk powder	2.7 lb.	2.5 lb.
Water	7.0 lb.	7.0 lb.
"Dariloid"	0.5 lb.	0.5 lb.
Butter color	75 ml.	75 ml.
Starter distillate	25 ml.	25 ml.
Salt	5 oz.	5 oz.

* Or the equivalent of cream and skim milk.

With All Cream

Cream, 50 percent	90 lb.
Powdered skim milk	2 lb.
Water	7 lb.
"Dariloid"	0.5 lb.
Butter color	150 lb.
Starter distillate	30 ml.
Salt	1.5 lb.

Directions

For general directions, see Formula No. 426.

Heat the water to 150 to 160 deg. F. Add the stabilizer and salt to this hot water under constant agitation, until all the stabilizer has dissolved. Add this mixture to the other ingredients.

Pasteurize at 150 deg. F. for 30 minutes and then homogenize at 3,500-lb. pressure. Cool, add the starter distillate, and allow to set in the refrigerator until firm.

The product should test 45 percent butterfat, 6 percent milk-solids-not-fat, and 0.5 percent "Dariloid." The proportions of butter and cream can be varied within the limits of the formulas given, provided the final product has this composition.

Formula from Pyenson and Tracy.

FORMULA NO. 434

Skim Milk Meat Loaf

Pork, blade meat or extra lean trimmings, cured	85 lb.
Bull meat or boneless chuck, cured	15 lb.
Dry milk solids, not over 1½ percent fat	10 lb.
Ice water	27 lb.
White pepper	6 oz.
Salt	12 oz.
Paprika	2½ oz.
Onion powder	1 oz.
Garlic powder	½ oz.

Directions

Grind the pork through a 1-in. plate. Grind the bull meat or boneless chuck through a ⅜-in. plate, then chop fine in a silent chopper. During chopping, add the dry milk solids, water, and the spices which have been mixed together thoroughly. If the spices are not well mixed before being added, the paprika will not be evenly distributed.

Put the ground pork and beef in a mixer and mix thoroughly.

When mixing is completed, stuff in "Frank," "Hoy," or similar molds. Cook in water at 160 to 165 deg. F. Cook until the inside temperature reaches 155 deg. F., which should be about 2 to 2½ hours.

When cooked, place in cooler and chill. Remove from molds and wrap or stuff into cellulose casings.

Formula from American Dry Milk Institute.

FORMULA NO. 435

French Custard Cream Filling

Liquid milk	4 lb.
Granulated sugar	1 lb. 6 oz.
Emulsifying shortening	3 lb. 2 oz.
Egg yolk	12 oz.
Butter	10 oz.
Cornstarch	5 oz.
Salt	¼ oz.
Vanilla	1 oz.

Directions

Bring to a boil 3 lb. 12 oz. of liquid milk, 12 oz. of sugar, 2 oz. of shortening and 2 oz. of butter. Mix egg yolk, the remainder of the granulated sugar, the cornstarch, salt and remainder of the milk, and add this mixture gradually to the boiling milk solution, stirring constantly with a wire whip until thick. Remove from fire, stir in the vanilla and set aside to cool.

Mix the shortening and butter in the machine bowl until smooth, and at 70 to 75 deg. F. Add the cool, cooked mixture gradually and mix at medium speed until light and smooth.

Be sure that the cooked cream is cold before it is added to the shortening. This filling must be kept covered and under refrigeration when not in use.

Variation

One batch of fresh fruit lemon filling, Formula No. 417, may be substituted for the cooked mixture in this filling.

Formula from Lever Bros.

FORMULA NO. 436

Glaze for Meat Loaves

Cane sugar	2 lb.
Paprika	8 oz.
Glucose	8 oz.
Gelatine	1 lb.
Boiling water	2½ lb.

Directions

After a meat loaf mixture has been filled into well-greased loaf pans, it can be brushed lightly with the above mixture.

Formula from Crescent Manufacturing Co.

FORMULA NO. 437

Yeast-Raised Doughnuts Made with Potatoes

Potatoes, boiled and mashed	2 lb.
Sugar	1 lb.
Shortening	1 lb. 4 oz.
Salt	3 oz.
Whole eggs	12 oz.
Vanilla	½ oz.
Lemon flavor	½ oz.
Whole milk	3 lb. 4 oz.
Yeast	8 oz.
Bread flour	3½ lb.
Cake flour	4 lb.

Directions

Cream until light the potatoes, sugar, shortening, salt, eggs and flavoring, with 1 lb. of cake flour added. Dissolve the yeast in the milk and add to this mixture, then add the flour. Mix to a medium dough but do not overmix. The dough temperature should be 86 deg. F.

Give 15 minutes' time, then roll out to the desired thickness for cutting. Cut doughnuts to weigh approximately 1¼ oz. Place on a cloth and proof until very light. Fry in fat at a temperature of 375 to 385 deg. F.

Formula from General Mills.

NOT OVER-FLAVORED

NOT UNDER-FLAVORED

BUT JUST RIGHT . . .

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TO forward-looking, economy-minded food producers, M M & R extends an opportunity to enjoy *the advantages of an exclusive change* in flavor oil packaging and control* . . . FLAVOR OILS PACKAGED IN UNIFORM BOTTLES OF ANY SIZE OR COMBINATION OF SIZES TO FIT FLAVORING FORMULAE REQUIREMENTS.

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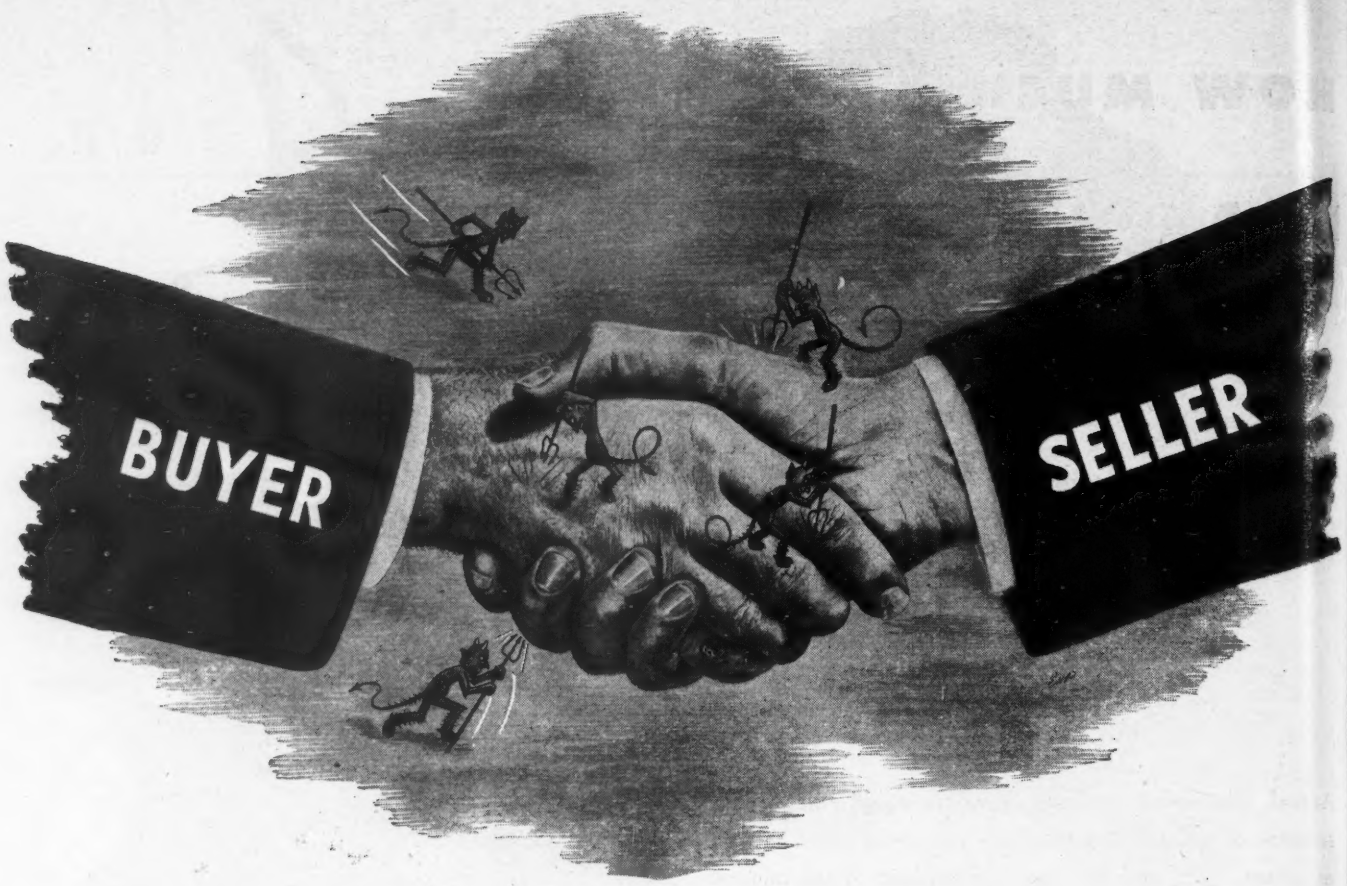

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Send for Information on this new form of vitamin A concentrate. Get specific details. Test Myva-Dry Vitamin A Powder and see how it adds new value to your products. DPI's Service Laboratory will work with your technical men to develop a proper incorporation formula.

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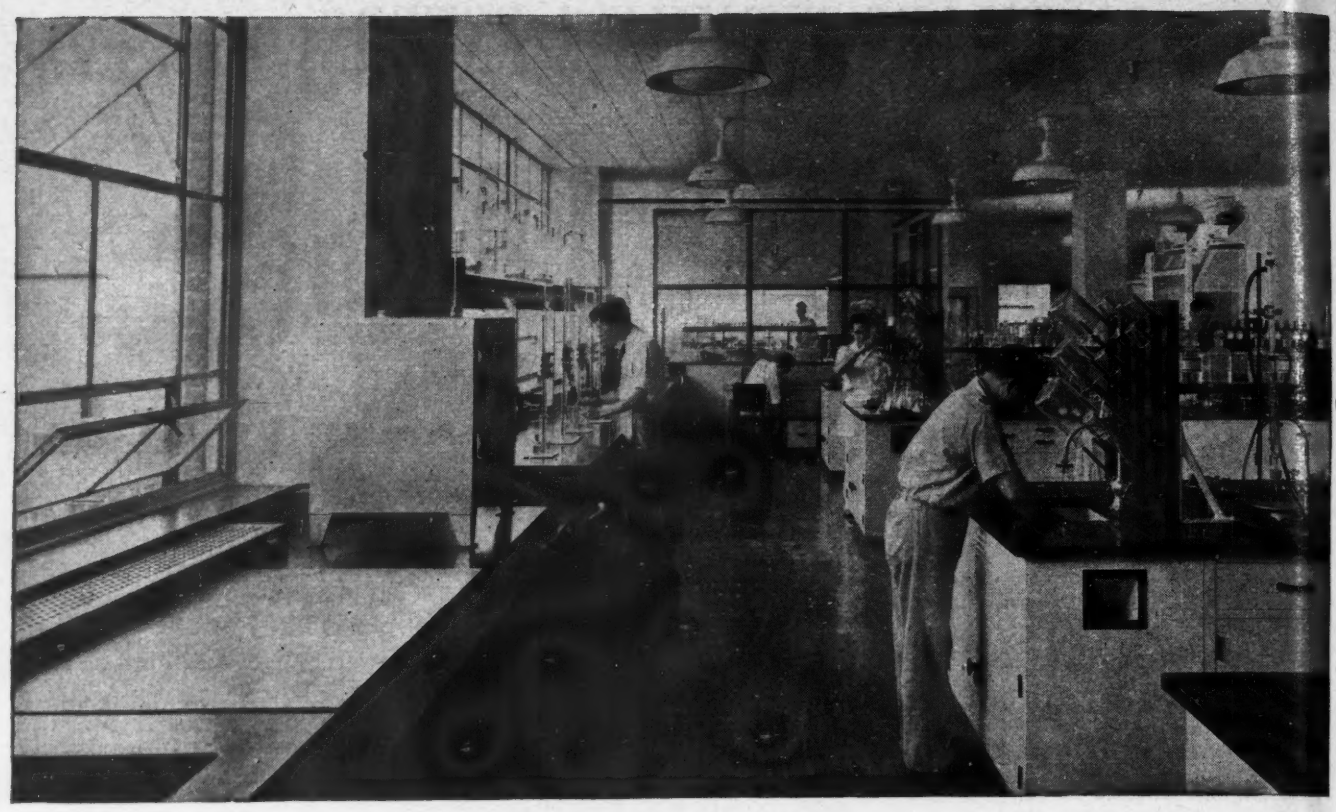

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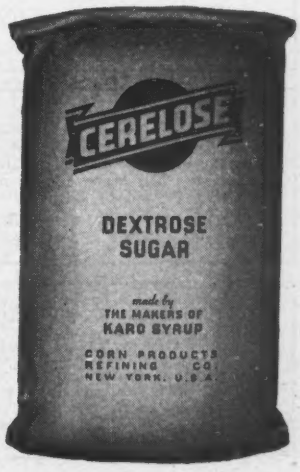

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SPICEOLATES

"SOLUBILIZED" SPICE OIL FLAVORS

Use these fine spice flavors to solve one of today's big supply problems... the scarcity of spice oils. SPICEOLATES will not only stretch your present spice oil stocks, but will also completely replace the dry spices you may now be using.

DODGE & OLCOTT COMPANY

180 VARICK STREET · NEW YORK, N. Y.

BOSTON · CHICAGO · PHILADELPHIA · ST LOUIS · LOS ANGELES

Plant and Laboratories Bayonne, N. J.

Are you winning the "war of movement" in your plant?

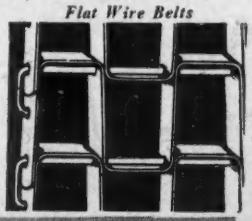
THE steady flow of goods to the war fronts begins in America's busy plants. One way to prevent production tie-ups is to transport goods within the plant on reliable, continuous conveyor belts. U·S·S Cyclone Metal Conveyor Belts have the strength to stand up under severe punishment. They are unharmed by water and steam. They are flexible, porous, heat-resistant and sanitary.

Available in Flat Wire and Chain Link types—in a variety of weights, widths and sizes of mesh. Wide selection of types, including belts specially designed for food dehydration processes. Write us for further information and prices.

USS CYCLONE Red Tag METAL CONVEYOR BELTS — CYCLONE FENCE DIVISION American Steel & Wire Company — United States Steel Corporation Subsidiary

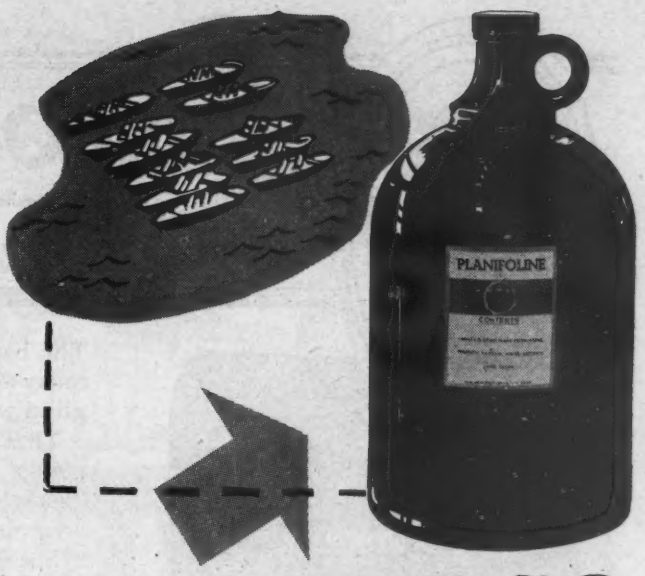
Chain Link Belts

Flat Wire Belts



CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Waukegan, Ill. · *Branches in principal cities*
United States Steel Export Co., New York

CYCLONE *Metal Conveyor Belts* — UNITED STATES STEEL



CARGO VESSEL

Taking the place of ships carrying vanilla beans from MEXICO, MADAGASCAR, TAHITI and other sources—A NEW SYNTHETIC. Releasing transports for the all-out effort of the United Nations. Helping, through creative chemistry, to build the "bridge of ships" . . . a vital link in our front line of attack.

PLANIFOLINE

*TRADE MARK REG.

(Reproduction of Vanilla Planifolia)

A carefully balanced—synthesized reproduction of the physical and natural entities found in the extractive matter of the finest vanilla beans. In taste and aroma, possessing all the characteristics of Pure Vanilla.

ECONOMICAL-PRACTICAL-EFFECTIVE

For industrial use only . . . in various concentrations. Particularly adaptable for use in the ice cream, baking and confectionery industries.

WHEREVER THE TASTE OF PURE VANILLA IS DESIRED . . . WHEREVER VANILLA SUGAR IS USED

PLANIFOLINE TWO FOLD.....	$ 9.00 per gallon
PLANIFOLINE FOUR FOLD.....	16.00 per gallon
PLANIFOLINE EIGHT FOLD.....	28.00 per gallon
PLANIFOLINE TWELVE FOLD.....	36.00 per gallon

Florasynth LABORATORIES, INC.

1533 OLMSTEAD AVE., NEW YORK, N. Y.

CHICAGO • DALLAS • DENVER • LOS ANGELES
NEW ORLEANS • SAN FRANCISCO • SEATTLE

Florasynth Labs. (Canada) Ltd. — Montreal • Toronto • Vancouver • Winnipeg
Florasynth Laboratories de Mexico S. A. — Mexico City

LINCOLN *KNEW* WHAT *WE'RE* FIGHTING FOR

"It is a struggle for maintaining in the world that form and substance of government whose leading object is to elevate the condition of men—to lift artificial weights from all shoulders; to clear the paths of laudable pursuits for all; to afford all an unfettered start."

A. Lincoln

The basic reasons for war haven't changed. They are the same today as they were nearly 80 years ago, when Lincoln was struggling with the problems of internal conflict.

That's why production at HOTTMANN, and thousands of other plants, is today devoted to preserving the right to engage in "laudable pursuits." That's why present thinking and planning are pointed to the day of normal, peacetime business competition.

Speaking of competition—what are you doing about it? The day is not far distant, we hope, when it will again be with us. Then the plant that's ahead with better equipment, production methods, products, appeals and prices, will reap the greatest reward.

HOTTMANN MIXING EQUIPMENT will fit into your post-war plans because it's "job engineered"* for the work you want it to do. And even more important to those in the Meat Processing Industry, is the fact that our equipment is tested and perfected under actual working conditions. With the new ideas and improvements that our engineers have worked out, it will be more helpful to you than ever before.

We're ready, of course, to discuss your problems and plans. Orders for equipment are being accepted and will be shipped as soon as possible after the war, in the order that we receive them now.

***"JOB ENGINEERED"**

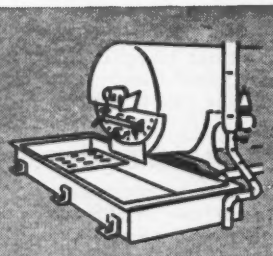
In considering plant layout revisions or new equipment, you'd better see what HOTTMANN has to offer.

Experience of more than a quarter of a century in the mixing equipment business has taught us that it's better to build equipment "engineered" to produce a maximum of your product, rather than to adapt your product to equipment we like to build.

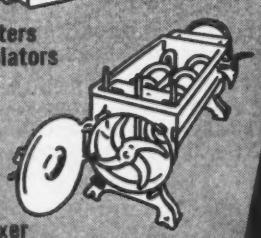
That is why we invite you to submit your problems for the consideration of our Engineering Department. They'll do their best to solve them.

Put Your Mixing Problems up to

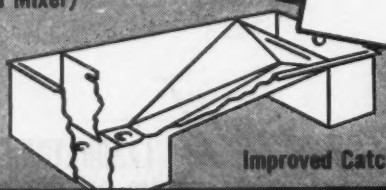
HOTTMANN



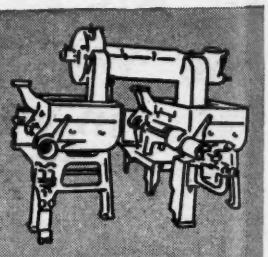
Fat Melters and Percolators



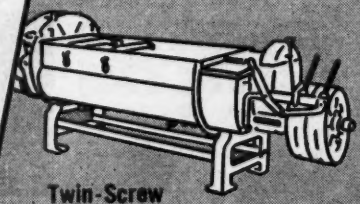
Kutmixer (Combined Cutter and Mixer)



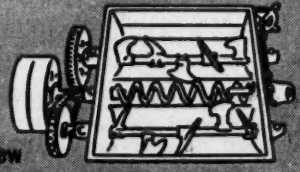
Improved Catch Basin



Yeast Machinery



Twin-Screw Super Mixer



Mixer, Interior view

THE HOTTMANN MACHINE COMPANY

3325-47 East Allen Street • Philadelphia, Penna.

AMERICA NEEDS FATS AND OILS AS IT NEVER NEEDED THEM BEFORE!

This is an urgent, patriotic appeal from our Government to every abattoir, packing establishment, food processing plant—every restaurant, hotel and home, in the United States, to—

Save More Fats and Oils!

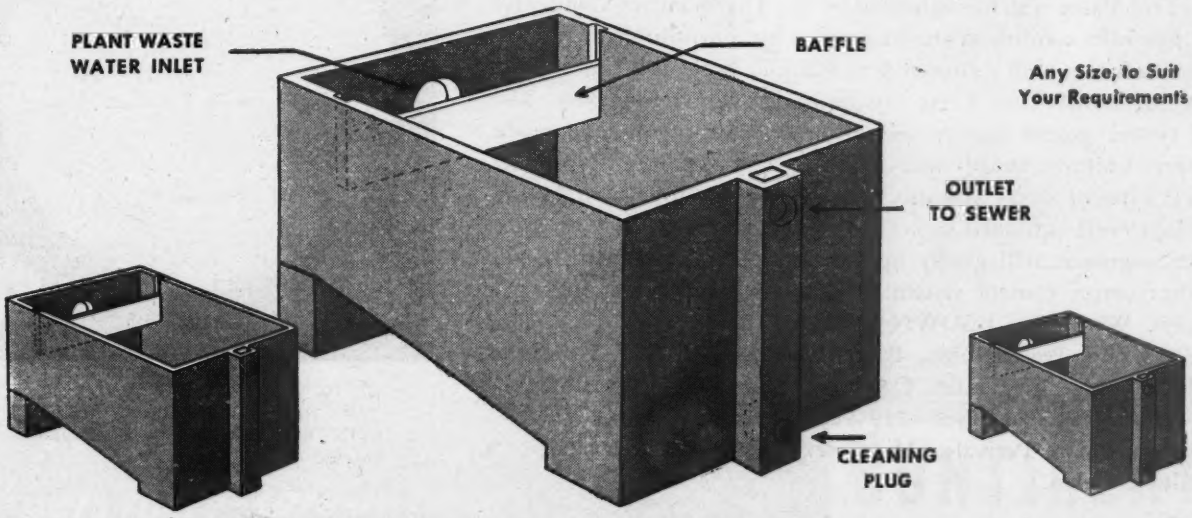
They're needed NOW for the making of GLYCERINE—a basic ingredient of EXPLOSIVES.

Fats and oils—the very same things that pollute streams, and that are now a continual expense to you when allowed to clog up your sewers, can be put to work to help shorten the war. Uncle Sam will pay you well for every pound you recover.

To speed the war effort, and make fat and oil recovery comparatively simple, we have added to our regular line of catch basins a—

Victory Fat Recovery Basin

It is non-corrosive, completely sanitary and is made from *non-critical materials.* You can get one immediately at a moderate price, *without any priority or red tape.* Its usefulness and efficiency will not cease with the war. Send for full particulars.



THE HOTTMANN MACHINE COMPANY

3325-47 East Allen Street • Philadelphia, Penna.

Assures Correct Drying in

DEHYDRATION

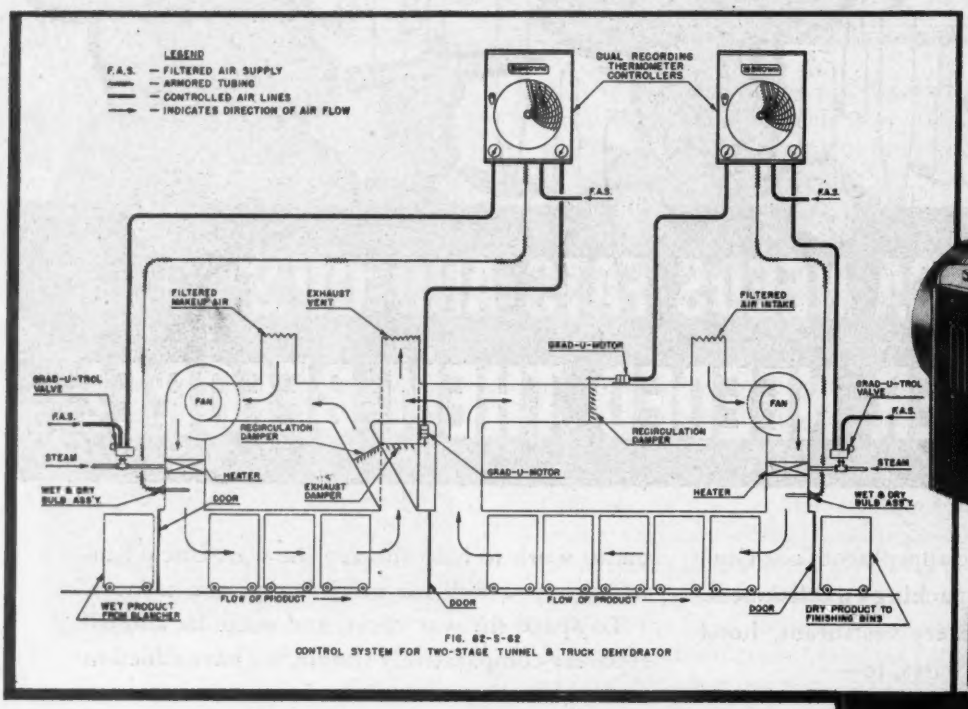


FIG. 62-S-62
CONTROL SYSTEM FOR TWO-STAGE TUNNEL & TRUCK DEHYDRATOR

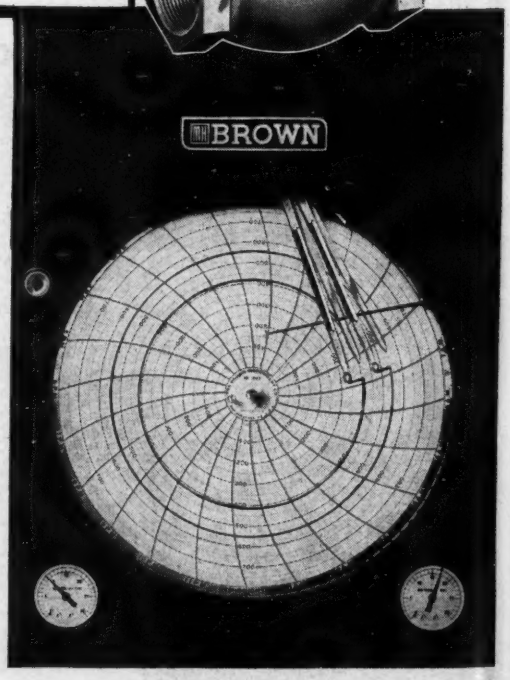
GRAD-U-TROL VALVE
For details write for catalog 8301.

In dehydration of vegetables, the prime requisites are accurate control of temperature, humidity, air velocity and volume.

The above illustration shows how Brown and Minneapolis-Honeywell Controls maintain these variables at the desired points in the operation of a two-stage tunnel dryer.

In dehydrating potatoes, for example, both sections of the dryer are controlled in an identical manner. Correct temperature is maintained by adjusting the flow of steam to the heater by means of the Grad-U-Trol Valve which is operated by the Thermometer Controller. Correct humidity conditions are maintained by controlling the amount of air recirculation with a Brown Wet and Dry Bulb Controller which actuates the Grad-U-Trol Valve regulating the Louvre dampers. This control system guards against over-drying, under-drying and waste, and assures uniform quality and appearance of the finished product. Whatever type of dryer you use, you can get it Brown and Minneapolis-Honeywell equipped direct from the manufacturer.

Brown engineers will gladly call at your plant. They will recommend the correct control system without obligation. Catalogs sent on request. Write THE BROWN INSTRUMENT COMPANY, 4502 Wayne Avenue, Philadelphia, Pennsylvania, a division of Minneapolis-Honeywell Regulator Company, Minneapolis, Minnesota. Offices in all principal cities. 119 Peter Street, Toronto, Canada—Wadsworth Road, Perivale, Middlesex, England—Nybrokajen 7, Stockholm, Sweden.

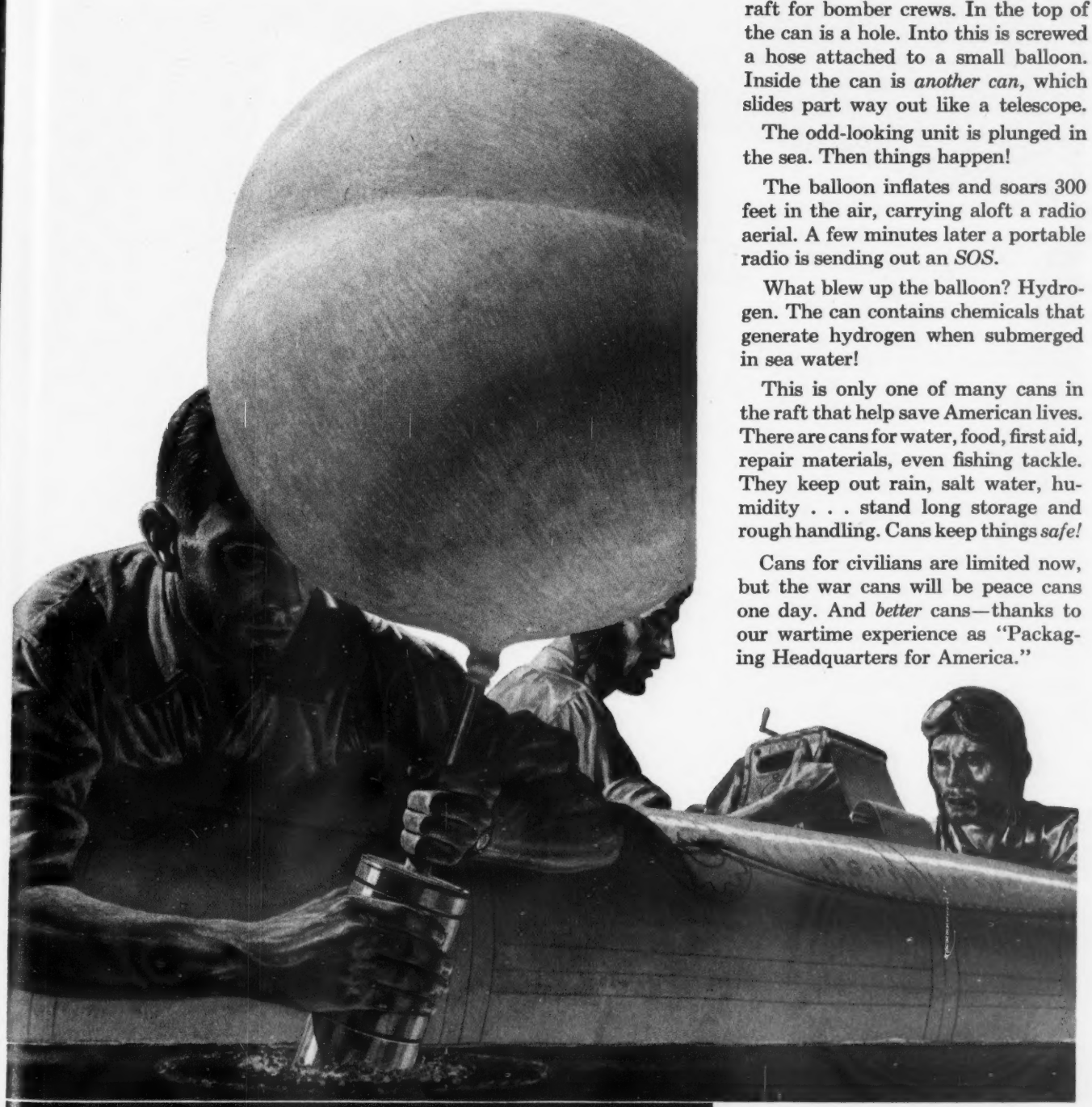


BROWN 10% THROTTLOR DUAL AIR-OPERATED TEMPERATURE CONTROLLER. *For details write for catalog 8903.*

Instruments by **BROWN** *and Controls by*

MINNEAPOLIS-HONEYWELL

The amazing can... THAT BLOWS UP A BALLOON THAT CARRIES UP AN AERIAL THAT RADIOS AN SOS!



Fantastic, you say? Yes—but true!

This can is used in a new type life raft for bomber crews. In the top of the can is a hole. Into this is screwed a hose attached to a small balloon. Inside the can is *another can,* which slides part way out like a telescope.

The odd-looking unit is plunged in the sea. Then things happen!

The balloon inflates and soars 300 feet in the air, carrying aloft a radio aerial. A few minutes later a portable radio is sending out an *SOS.*

What blew up the balloon? Hydrogen. The can contains chemicals that generate hydrogen when submerged in sea water!

This is only one of many cans in the raft that help save American lives. There are cans for water, food, first aid, repair materials, even fishing tackle. They keep out rain, salt water, humidity . . . stand long storage and rough handling. Cans keep things *safe!*

Cans for civilians are limited now, but the war cans will be peace cans one day. And *better* cans—thanks to our wartime experience as "Packaging Headquarters for America."

CONTINENTAL CAN COMPANY

100 East 42 St., New York City

HELP CAN THE AXIS—BUY WAR BONDS

How will Post-War transportation affect YOUR POST-WAR PLANS?

The TRAILER COMPANY OF AMERICA
TRAILMOBILE
CINCINNATI, OHIO

Dear Sir:

Every crisis, whether war or economic, produces great changes. These have a purgative effect resulting in Progress.

This law of the world naturally applies to transportation, particularly truck-trailer transportation, because this fast, economical method of moving merchandise and materials is relatively young.

Because of the time factor, many of the major development have yet to come. However, the demands of our current war effort, both overseas and on the home-front, are now producing many improvements which are bound to contribute in a major way to perfecting post war plans in which the flexible medium of transportation will be required to "get it there" faster and cheaper.

We at Trailmobile wanted you to know that lessons learned from our record of producing equipment for the Armed Forces have prepared us to produce better trailers for civilian use. New Trailmobiles will be available when our increased obligations to the Armed Forces are completed.

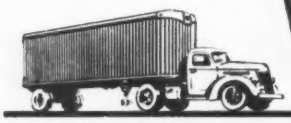
Won't you write us if we can be of service in helping you complete your Post War Transportation Plans to "get it there" faster and cheaper with Trailmobile?

Yours very truly,

THE TRAILER COMPANY
OF AMERICA

Please address Dept. B

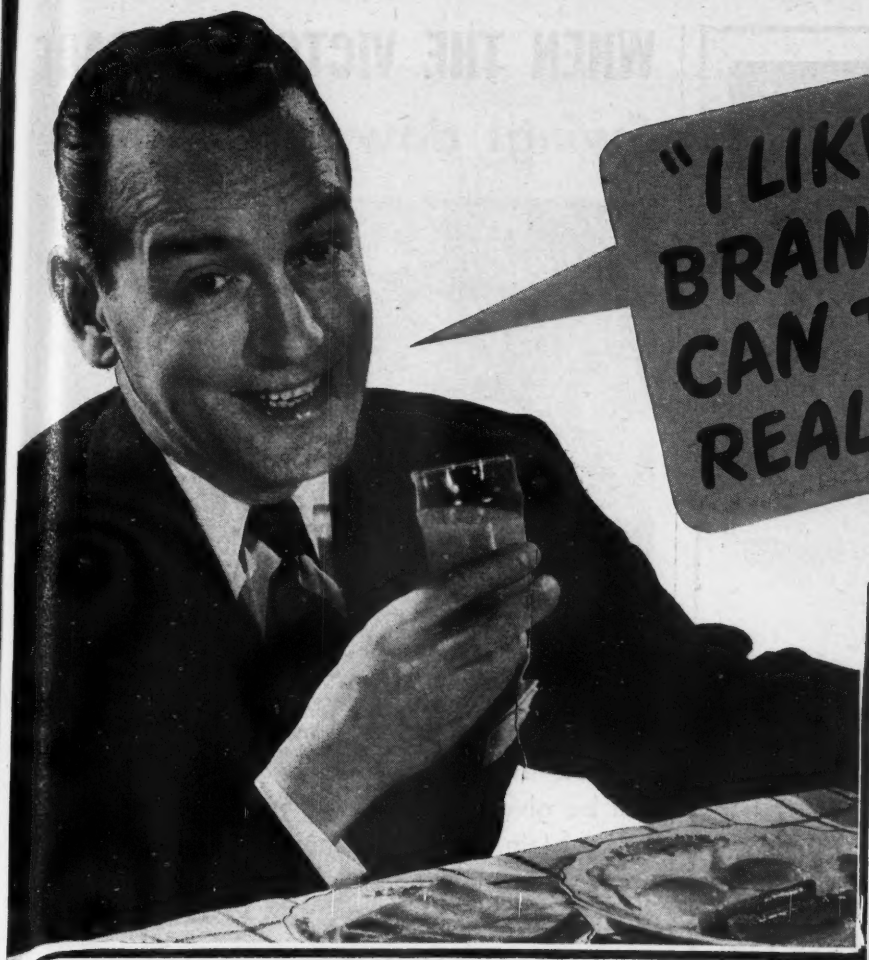
ARMY E NAVY



TRAILMOBILE

Commercial Trailers for War and Peace

CINCINNATI, OHIO • BERKELEY, CALIFORNIA
BRANCHES IN LEADING CITIES



Customer satisfaction and the use of Cuno "Filter-Fine" Strainers are definitely related.

Your Cuno-filtered product is free from impurities or undesirable coarse particles — for example, in fruit juices the pulp or skin is removed, but the beneficial smaller particles such as the tasty "buds" and fine pulp which increase both the food value and customer appeal, are retained in the fruit.

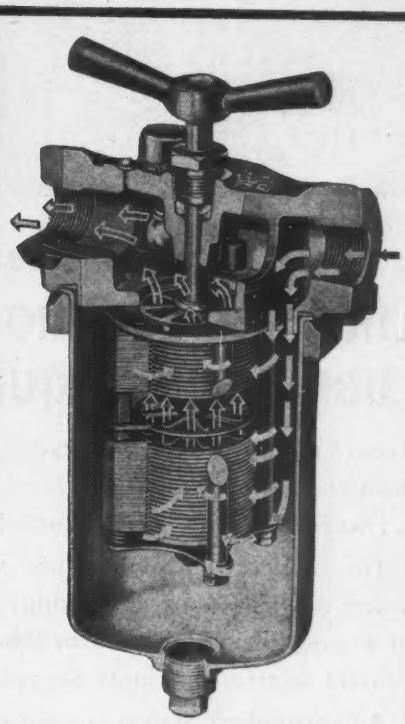
For the food industry, Cuno has designed filters which will strain out all particles larger than specified, the smaller ones remaining in the fluid.

Besides, Cuno Auto-Kleans are trouble-free. Unlike a wire screen strainer, the element is non-collapsible — there's no danger of an accident permitting dangerous or unwanted particles getting through.

Don't risk your product's reputation with haphazard straining. Protect it this easy, low-cost way.

Non-Stop Straining Saves You Time and Money

Here's another real advantage of the Cuno Auto-Klean. You never have to interrupt flow to clean or replace a clogged filter element — a turn of the handle (by hand or motor) *combs out* embedded solids. And pressure drop is much less than with wire screen strainers. Use the coupon below for "Quick Facts" — today!



CUNO AUTO-KLEAN will protect these products from foreign solids

- Baby Foods
- Molasses
- Jellies and Preserves
- Candy
- Salad Dressings
- Cocoa Butter
- Oleomargarine
- Fruit Juices and Syrups
- Tomato Catsup
- Peanut Products
- Chocolate
- Lard Compounds and Substitutes
- Mustard

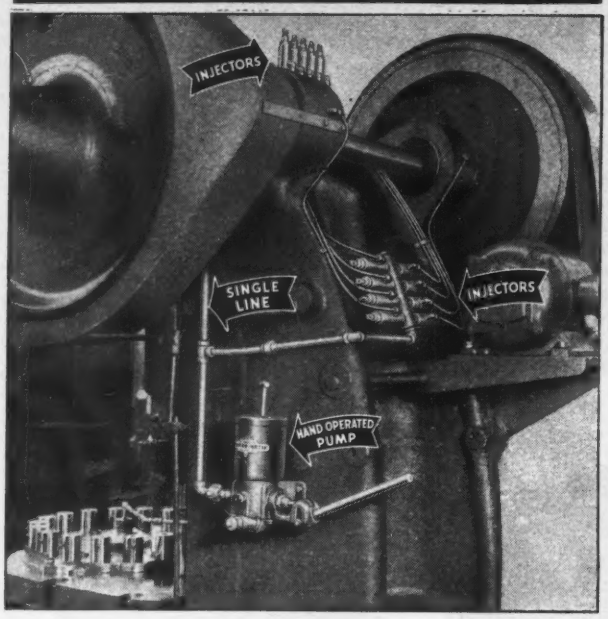
KEEP FLOW ON "GO" WITH

CUNO

THE "FILTER-FINE" STRAINER

CUNO ENGINEERING CORPORATION
411 South Vine Street, Meriden, Conn.
Send me the free booklet, "Quick Facts"
NAME.....
COMPANY.....
ADDRESS.....
Product to be strained.....

Guard Against Bearing Failures -- and Keep Foodstuffs Rolling!



Equip your machines with

LINCOLN CENTRO-MATIC LUBRICATING EQUIPMENT

Reduce the threat of bearing failures which cause maintenance shut-downs . . . Save machine-hours . . . Save man-hours—with Centro-Matic Systems.

The modern Lincoln method of lubrication makes it possible for *all* bearings on a machine, or a series of machines, to be lubricated from a central source—without stopping machines.

A Centro-Matic System consists of a number of Centro-Matic Injectors—one for each bearing—and a power operated or a hand operated Centro-Matic Lubricant Pump. A power operated system can be semi-automatic or fully automatic . . . Only a single lubricant supply line is required . . . Easily installed on new or old machines.

Write us today for complete information

ARMY E NAVY

The ARMY-NAVY PRODUCTION AWARD for high achievement in the production of war equipment, conferred upon the Lincoln Engineering Company has had a star added. This star symbolizes 6 more months of exacting service to our Armed Forces, delivering vital materials so necessary for ultimate Victory.

FOR VICTORY—BUY U. S. WAR BONDS and STAMPS 143-42

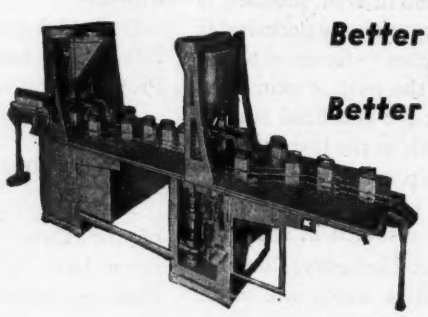
LINCOLN ENGINEERING COMPANY
PIONEER BUILDERS OF LUBRICATING EQUIPMENT
5701 NATURAL BRIDGE AVENUE, ST. LOUIS 20, MO., U. S. A.

WHEN THE VICTORY PARADE *Swings down 5th Avenue*

When that great day comes—when freedom is assured to all peoples everywhere—then our boys will be given that rousing "Welcome Home" on every Main Street in America—then we hope to serve you once more with Filling and Packaging Equipment.

But until then Uncle Sam needs our plant and equipment. That's why for the present we are unable to give our usual service for new equipment or repairs.

We know you understand!



Better Machines for Better Packages

S. & S. 4 station Automatic Filling Machine.

STOKES & SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

FILLING
PACKAGING
WRAPPING
MACHINES

4911 SUMMERDALE AVE., PHILADELPHIA 24, PA.

buell

DUST RECOVERY SYSTEMS

Recognized throughout industry for their outstanding qualities and performance

The high efficiency of Buell (van Tongeren) Powder Collectors, installed in conjunction with spray dryers in the dehydration of many food products, virtually eliminates powder losses in the exhaust.

Buell Powder Collectors specially designed for food processing, are made of special metals to meet all Pure Food requirements. Rounded corners prevent lodgment of material, and hinged construction facilitates take-down for easy cleaning. Buell Powder Collectors have no moving parts, require little or no attention, and will not clog.

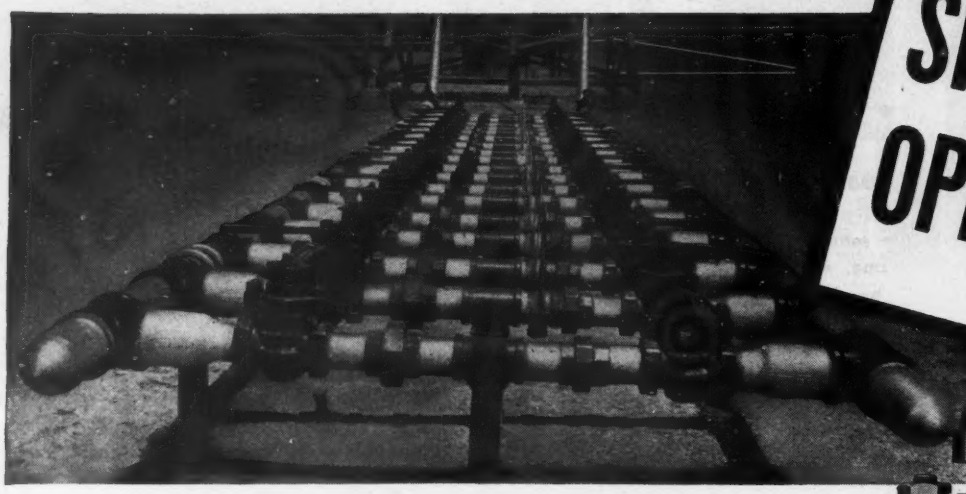
WRITE FOR BULLETIN G-842

BUELL ENGINEERING COMPANY, Inc.

SUITE 5000, 8 CEDAR STREET, NEW YORK 5, N. Y.

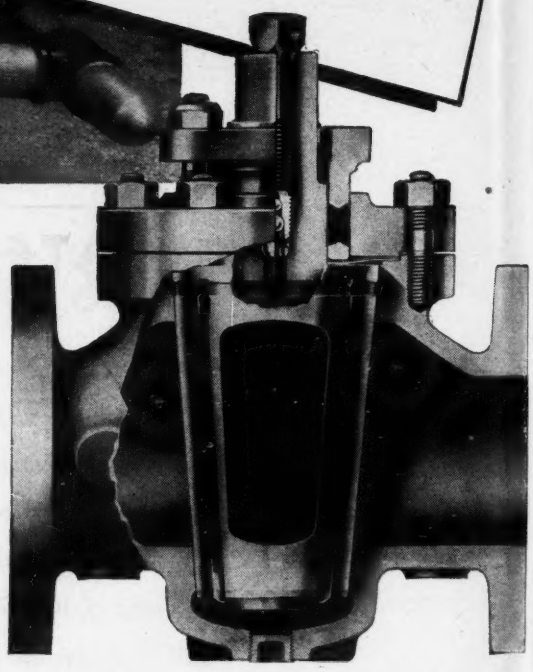
BUY WAR BONDS AND MAKE THE AXIS BITE THE DUST

"DIFFICULT" FLUIDS *Always Obey*



SHUT MEANS NO LEAKS

OPEN MEANS STRAIGHT-LINE FLOW



with Walworth

LUBRICATED PLUG VALVES

Because:

1. The lapped surfaces of the valve are "pressure sealed" when the valve is in either the open or closed position.

2. "Pressure seal" is accomplished by forcing lubricant under high pressure to the bottom of plug as well as into a grooving system which completely encircles the ports.

3. Lubricant not only seals valve against leakage, but also reduces friction between plug and body, permitting easy operation.

4. Coating of lubricant protects plug and body of valve against contact with line fluid, thus combatting corrosion.

Walworth Lubricated Plug Valves are made in a full range of sizes, from ½" to 24", from vacuum to 5,000 p.s.i. For complete information, write for Circular 67.

SEND FOR CATALOG

You'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the new Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 East 42nd St., New York 17, N.Y. Dept. N2.

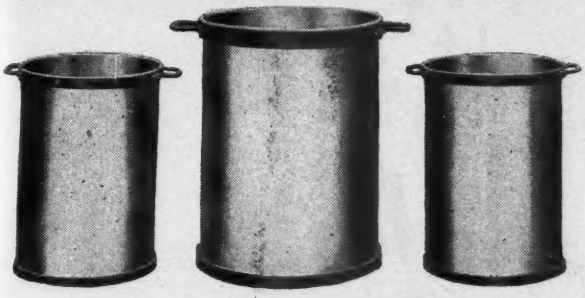
ARMY E ARMY E NAVY

BOSTON WORKS
KEWANEE WORKS

WALWORTH
valves AND fittings

WALWORTH ★★★ VALVES AND FITTINGS ESTABLISHED 1842

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



BATCH CANS

of Monel Metal or Stainless Steel

These handy and durable batch cans are seamed and reinforced at the top by an endless iron ring, with handles attached. The bottoms are reinforced by an iron cross welded to an iron chime. The range of capacities is from 10 to 75 gallons. The above are representative of our line of TERRISS Stainless Steelware. We are also prepared to fabricate equipment to specifications.

We carry a full line of Filter Paper. Also, Hose for all purposes. Send us sample of your needs.

CONSOLIDATED
SIPHON SUPPLY CO., INC.

DEPT. F. 22-24 WOOSTER ST. NEW YORK CITY

MERCOID
AUTOMATIC ★ CONTROLS

FOR REFRIGERATION AND VARIOUS FOOD PROCESSING APPLICATIONS

Mercoid DA Pressure or Temperature Controls for direct or remote mounting, have the outside double adjustment feature, which greatly simplifies setting the operating range, plainly indicated on a visible dial.

Mercoid Liquid Level and Float Controls available for various applications.

Mercury switches used exclusively in all Mercoid Controls, thereby assuring better control performance and longer control life.

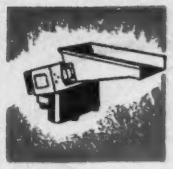
Catalog sent upon request

DA Controls for Temperature or Pressure

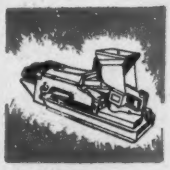
Liquid Level, Low Water and Boiler Feed Water Pump Controls

Float Control

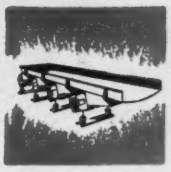
THE MERCOID CORPORATION, 4203 W. BELMONT AVE., CHICAGO 41, ILL.



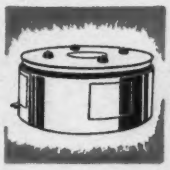
FEED



WEIGH AND FEED



CONVEY

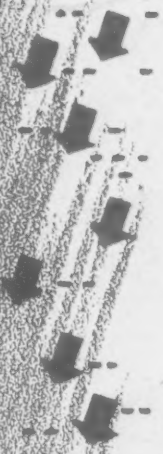


PACK

COOL

DRY

SCREEN



Any material--ranging from four-foot hunks to light powder --under

ABSOLUTE CONTROL

with

JEFFREY-TRAYLOR VIBRATING EQUIPMENT

(Patented)

These electrically-controlled vibrating units are instantly adjustable—free from wearing parts—require no lubrication. Let us show you how to handle more than 300 different types of material by this superior method. Catalog No. 750.

JEFFREY-TRAYLOR DIVISION

THE JEFFREY MANUFACTURING COMPANY

ESTABLISHED 1877

927-99 North Fourth St., Columbus 16, Ohio

SALES OFFICES: Boston, Buffalo, Detroit, Huntington, Pittsburgh, Baltimore, Chicago, Denver, Milwaukee, Scranton, Birmingham, Cleveland, Marion, New York, St. Louis, Boston, Cincinnati, Montreal, Philadelphia, Salt Lake City

Tons of supplies in steel containers for U. S. Marine and Navy forces in the Solomon area.

Steel Drums and Pails 3 gal. to 55 gal. capacity.

STEEL CONTAINERS

A necessity for the safe delivery of petroleum products, munitions and food to our armed forces. Containers you perhaps have had to do without to insure Victory.

INLAND STEEL CONTAINER CO.

Formerly WILSON & BENNETT MANUFACTURING COMPANY

6532 S. MENARD AVE. CHICAGO, ILLINOIS

Plants at Chicago—Jersey City—New Orleans—Richmond, Calif.

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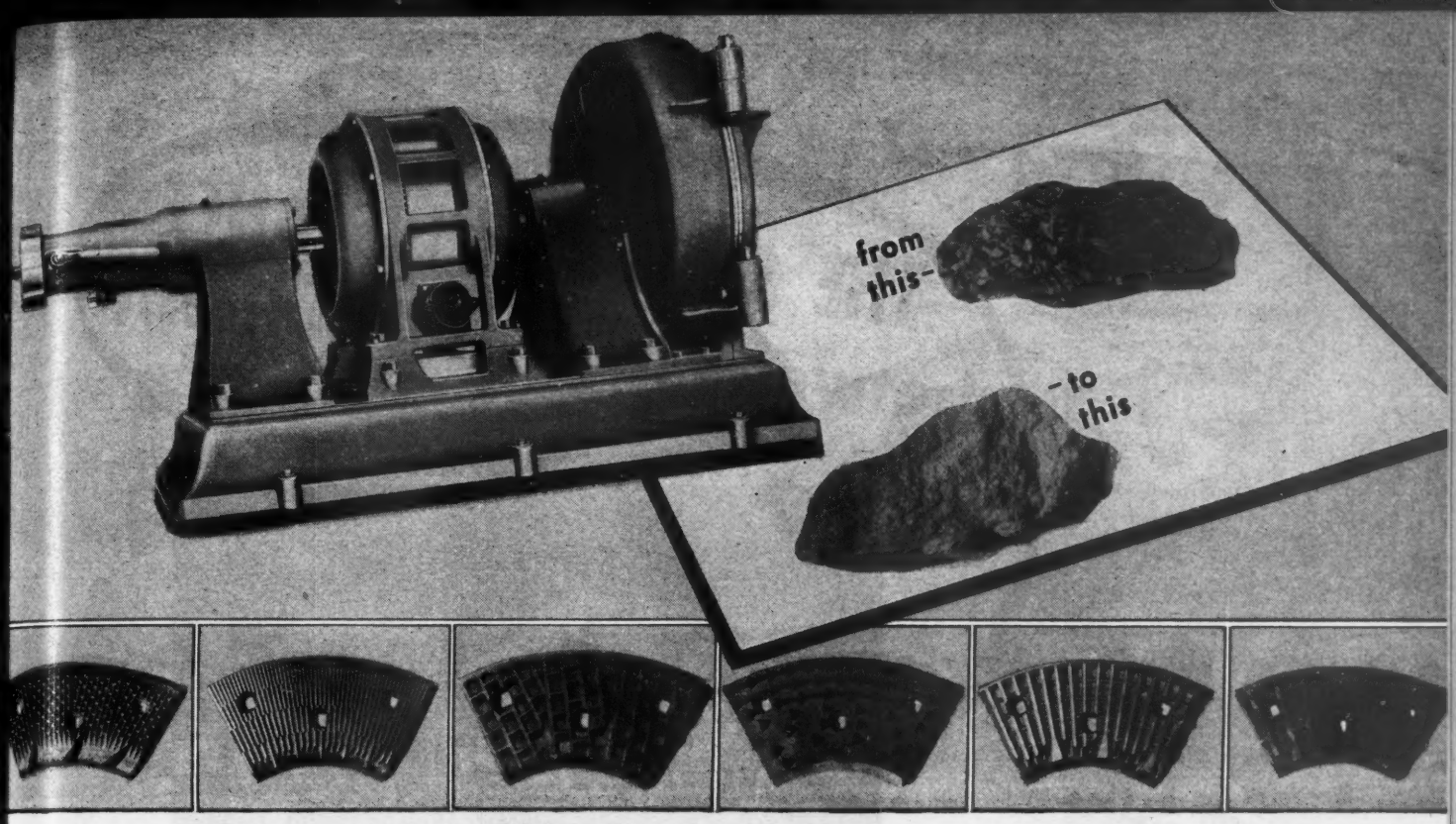


Six of the sixty or more reasons for the versatility of SPROUT, WALDRON ATTRITION MILLS. These plates show the variety of face patterns which, together with such features as adjustment of clearances while machine is running, oversize bearings, quick accessibility of working parts, low power requirements and high capacity per square foot of floor space, explain their records for production.

Interchangeable Grinding Discs and Speed Changes Let You Control Size Reductions with the Same SPROUT, WALDRON ATTRITION MILL

The SPROUT, WALDRON ATTRITION MILL is so versatile it belongs in nearly every food plant with a variety of grinding problems.

With a properly selected set of grinding plates—easily changed and easily cleaned—you can fine- or coarse-grind such diverse things as dried apples, berries, bread, leaves, milk and vegetables; or you can pulp fresh, moist or wet foods; or grind beans, biscuits, cereals, coffee, crackers, feeds, grains, nuts, seeds and spices.

Hundreds of test-run records with samples are available for inspection in the Experimental and Proving Department.

The grinding plates are made in six segments of hard white cast iron. They are rough and finish ground as a set to uniform and parallel thickness. Then they are weight-matched, with facing periferies trued, and balanced.

Result:—Unusually long life, uniform size reduction of particles, a quality output throughout.

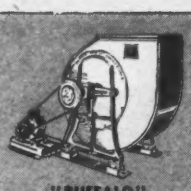
Tell us what you have to grind or pulp and we'll send information and service data on these Attrition Mills, some of which are still producing efficiently after 40 years' continuous operation.

● *Mixers, Grinders, Sifters, Feeders, Conveyors, Packers and Special Equipment for Process Industries.*

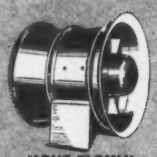
SPROUT, WALDRON & COMPANY

Manufacturing Engineers since 1866

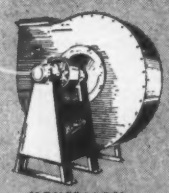
154 SHERMAN STREET MUNCY, PENNSYLVANIA



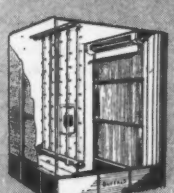
"BUFFALO"
Limit-Load Ventilating Fan



"BUF-FLOW"
Axial Flow Fan



"BUFFALO"
MX Mill Exhauster



"BUFFALO"
Air Washer

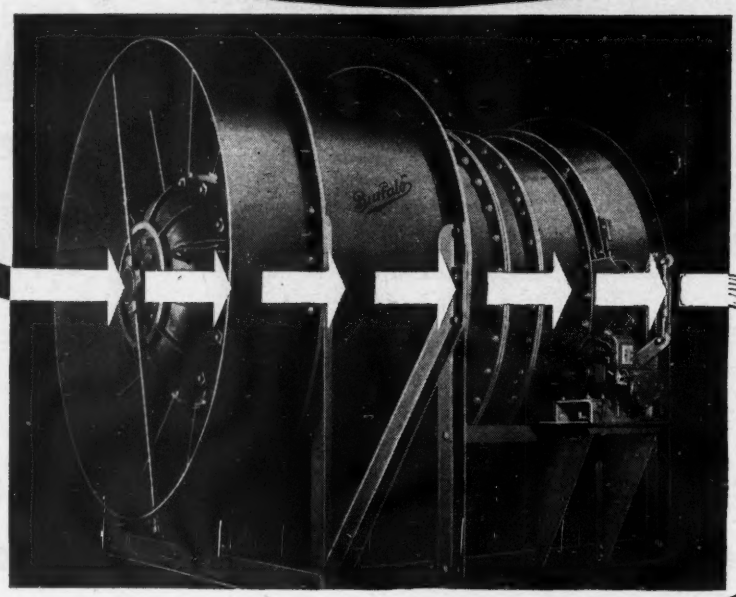
"BUFFALO"
Highboy Unit Heater

"BUFFALO"
Breeze Ventilating Fan

"BUFFALO"
Type E Blower

"BUFFALO"
Volume Fan

THE SHORTEST DISTANCE between inlet and outlet...



. . . is a BEE LINE

. . . and this "Bee Line" travelled by the air current through a "Buffalo" Axial Flow Fan is a noteworthy accomplishment in fan engineering. Propelled in a true axial direction, with special guide vanes providing a non-rotating movement as air leaves the outlet, the air flow is characterized by a minimum of turbulence and wasted energy — greatly increased fan efficiency on a wide range of applications. "Buffalo" Axial Flow fans have an exceptionally high capacity operating against pressure losses, perform quietly and with marked power savings. These factors—plus a husky construction and the non-overloading characteristic — make "Buffalo" Axial Flow Fans *the* equipment to investigate for difficult air handling problems. Engineering data in Bulletin 3229B.

ARMY E NAVY

BUFFALO FORGE COMPANY
152 Mortimer St. **Buffalo, N. Y.**
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" AXIAL FLOW FANS
"Air travels the bee-line route"

PUZZLE

What takes up even less shipping space than dehydrated foods?

WHEN you add up all the food needed by our fighting men, it ties up a lot of precious shipping—even in dehydrated form.

Uncle Sam wanted something that took up even less space. And he's found it—by shipping *dehydrating equipment*, instead of the finished product, to a southwest Pacific base where plenty of fresh food is available. We've just completed a rush order for a number of complete Taylor Automatic Control Systems for two-section tunnel dehydrators (similar to drawing below) for this shipment. A few tons of this equipment will make many hundreds of tons of food for the Armed forces.

Naturally, we're proud that as a result of our many years of experience in the food processing field, the dryer manufacturers insisted on Taylor Controls and their recommendations were readily approved by the procurement commission. Our only regret is that this shipment may have delayed you in getting the Taylor Instruments *you* ordered. So we suggest that if you need instruments for next season's pack, the time to order them is right now! Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.*

★ KEEP ON BUYING U. S. WAR BONDS ★

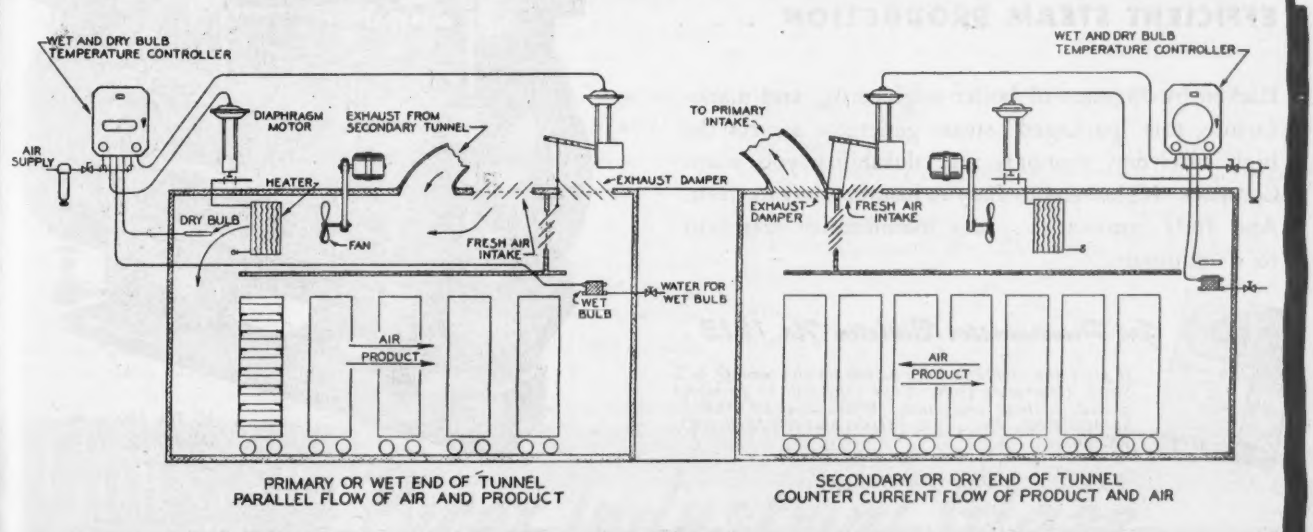
ARMY (E) NAVY

Taylor Instruments

MEAN

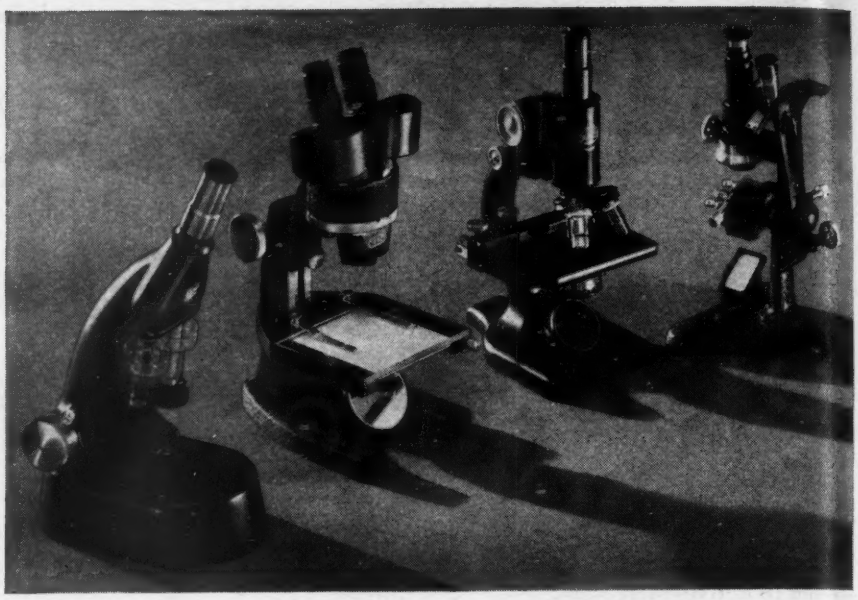
ACCURACY FIRST

IN HOME AND INDUSTRY



TWO SECTION TUNNEL DEHYDRATOR WITH TAYLOR AUTOMATIC CONTROL

Optical Instruments for the Laboratory



Wartime achievements in research and process control owe much to the optical instruments which extend vision and provide a means of measuring optical characteristics.

The Spencer Colorimeter is designed for convenience. The built-in illuminator and inclined eyepiece permit a comfortable position for the operator. Direct reading drums and separable cups speed up use.

The Stereoscopic Microscope extends human vision, retaining the natural position and movement in manipulating for careful inspection of detailed materials.

The Standard Laboratory Microscope with mechanical stage is easily equipped to provide the various types of illumination and magnification needed in industrial research and process control.

Four different Spencer Refractometers are now being produced for index and dispersion measurements of solids and liquids.

Although the demand on Spencer's facilities for the production of optical equipment for warships, planes, tanks and guns has been great, we have been able to supply many vital war industries with urgently needed, indispensible scientific instruments.

ARMY E NAVY

Spencer LENS COMPANY
BUFFALO, NEW YORK
SCIENTIFIC INSTRUMENT DIVISION OF
AMERICAN OPTICAL COMPANY

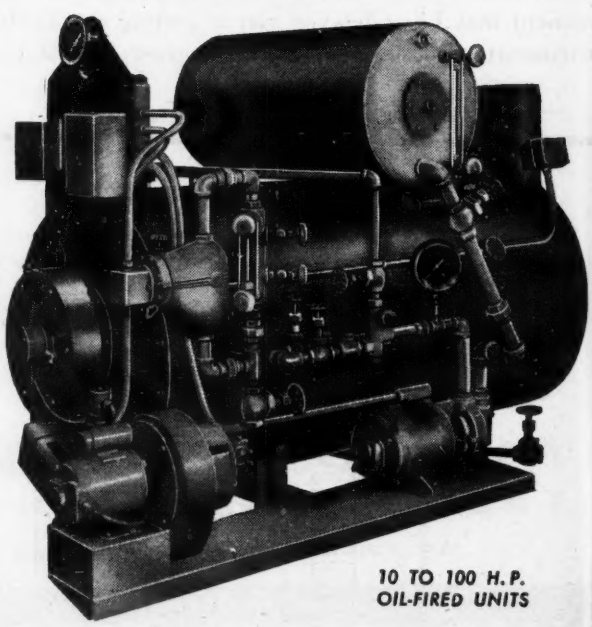
Gets "Steam Up" Faster!

NEW O&S *Powermaster* UNIT'S "BALANCED DESIGN" GIVES YOU MOST EFFICIENT STEAM PRODUCTION . . .

Backed by 58 years of boiler engineering and manufacture, this "packaged" steam generator assures the high efficiency, economy and durability you want. Compact. Lightweight. Easy to install. Easy to clean. And fully automatic . . . cuts maintenance attention to a minimum.

Get Powermaster Bulletin No. 1213 . . .

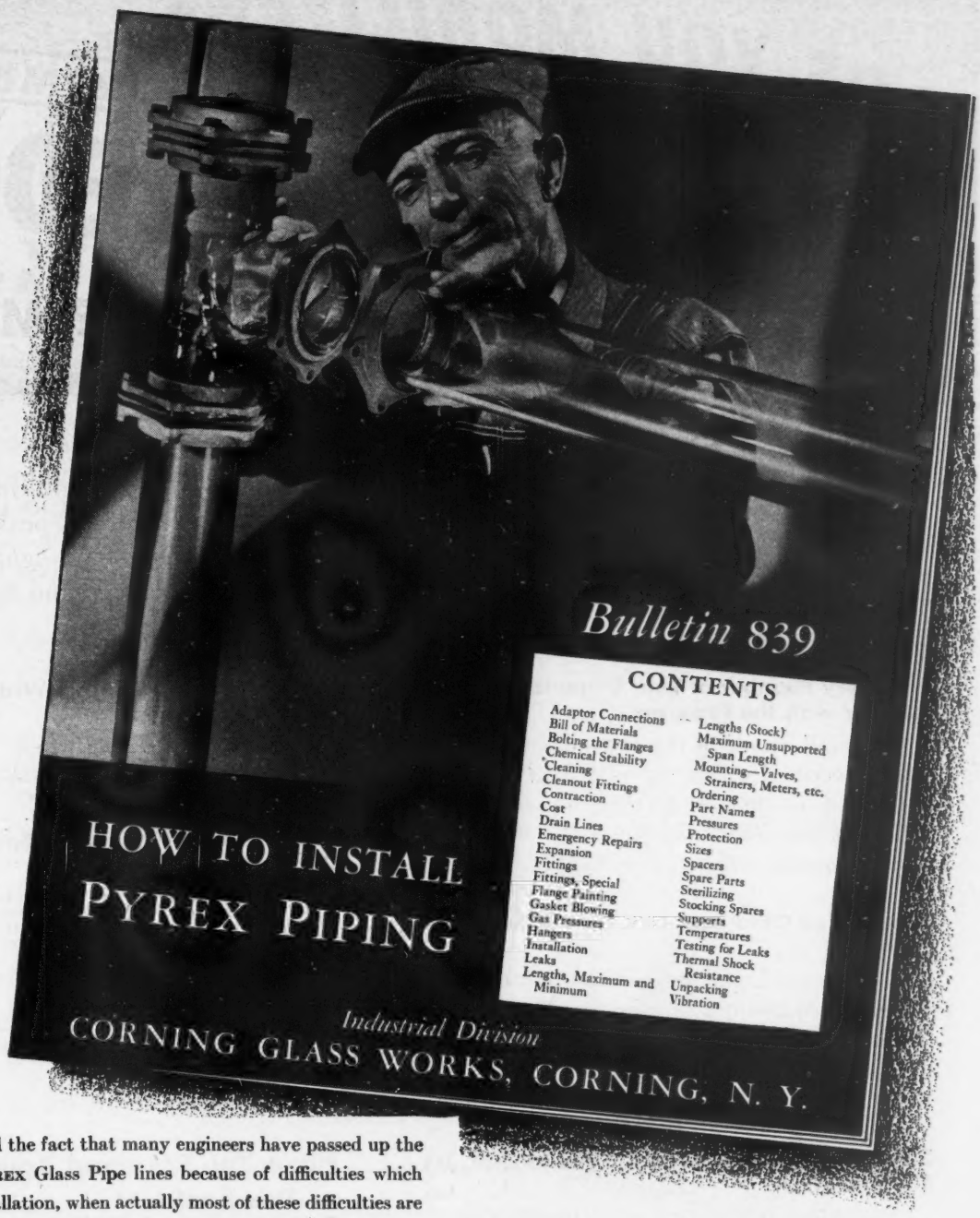
It gives you complete information on this new O & S Steam Generating Unit. Your copy will be promptly mailed, without obligation. Write now to ORR & SEMBOWER, INC., 932 MORGANTOWN ROAD, READING, PA.



10 TO 100 H.P.
OIL-FIRED UNITS

ORR & SEMBOWER INC. READING . PENNSYLVANIA

O&S Builders of Better Boilers Since 1885



A recent survey has disclosed the fact that many engineers have passed up the combined advantages of PYREX Glass Pipe lines because of difficulties which might be encountered in installation, when actually most of these difficulties are non-existent. Any competent plant maintenance man can install a PYREX Glass Pipe line as readily as he can install any other type of pipe line.

In order to further simplify the installation procedure, Corning has produced a new bulletin "How to Install PYREX Piping." In it you will find all of the answers to questions you may have on the subject. Note the table of contents.

After reading this bulletin you will readily see that installation problems are no reason for doing without these qualities of PYREX Piping:

1—Resistance to all acids and alkalies in solution, except HF.

2—Resistance to thermal shock.

3—Visibility which reveals both the condition of the pipe and its contents.

4—A smooth hard surface which resists abrasion and is conducive to smooth flow.

5—Long life which reduces cost to a minimum.

Send for your copy of this bulletin now. Use the coupon.

Corning Glass Works, *Industrial Division*, Dept. FI2, Corning, New York.

Gentlemen:

I would like glass piping information immediately on the subjects I have checked below. I understand there is no obligation.

☐ Installation Manual ☐ Valves

☐ PYREX Piping and Heat Exchangers ☐ Adaptors

Name.....

Firm.....

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City and State.....

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

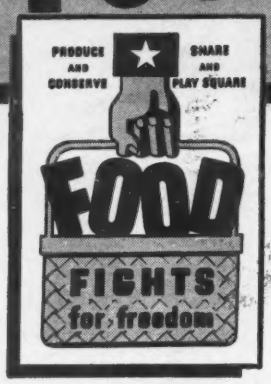
CORNING Glass Works Corning, New York

Pyrex Industrial Glass BRAND

ARE YOU MOBILIZED?

"FOOD FOR FREEDOM"

NOVEMBER IS THE MONTH!



November is "Food For Freedom" Month—and the *Food Fights For Freedom* program reaches its first dramatic peak! During this period, every one is being urged to make food *fight* for freedom. Are *you* doing *your* part? Are you *mobilized* and in *action?*

1. Is Every Member of Your Organization Familiar with the Program? YES ☐ NO ☐

Are all aware of the four all-important objectives? 1. *To increase food production.* 2. *To increase food conservation.* 3. *To increase food sharing.* 4. *To make all play square with our food supply.*

2. Have You Obtained the Official Theme Posters? YES ☐ NO ☐

Are you displaying window posters? Are you displaying wall posters? Are you displaying cashier counter cards? Are these display pieces posted in prominent positions?

3. Are You Using the Official Insignia and Messages? YES ☐ NO ☐

In your newspaper advertising? In your circular advertising? In all other forms of advertising?

4. Have You Inaugurated a Drive to Eliminate Waste and Spoilage in Every Possible Way? YES ☐ NO ☐

In your own organization? Are you doing all you can to inform consumers and your own organization how vital it is to make every crumb and drop of food count?

5. Are You Promoting Wider Use of Unrationed Foods? YES ☐ NO ☐

This program will help you to sell more of these plentiful foods.

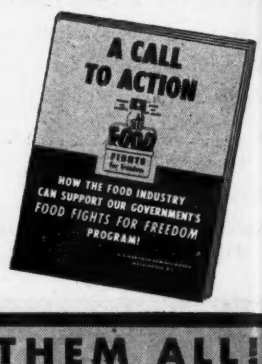
6. Have You Planned a Special Drive During November? YES ☐ NO ☐

Are you keying all advertising and promotion material into your November programs?

7. Are You Doing All You Can in Every Way to Make This Program Speed Up Victory's Time Table? YES ☐ NO ☐

Have You Received Your Copy of This Booklet?

If you have not received your free copy of the official booklet, "How The Food Industry Can Support Our Government's Food Fights For Freedom Program," write today to: U. S. War Food Administration, Department of Agriculture, Room 249W, Administration Building, Washington 25, D. C. This booklet gives you all the facts!



FOOD THE MIGHTIEST WEAPON OF THEM ALL!
★ MAKE EVERY CRUMB AND DROP OF IT COUNT ★

PREPARED FOR THE FOOD FIGHTS FOR FREEDOM PROGRAM WITH THE COOPERATION OF THE WAR ADVERTISING COUNCIL

Space Contributed by FOOD INDUSTRIES

Production Contributed by ARMOUR & COMPANY

Look out for CONCENTRATION-CELL CORROSION

...the corrosion that hides!

Often better known as "deposit attack" or "crevice corrosion," this action usually attacks hidden and secluded areas of metal. It destroys metal more rapidly than ordinary corrosion.

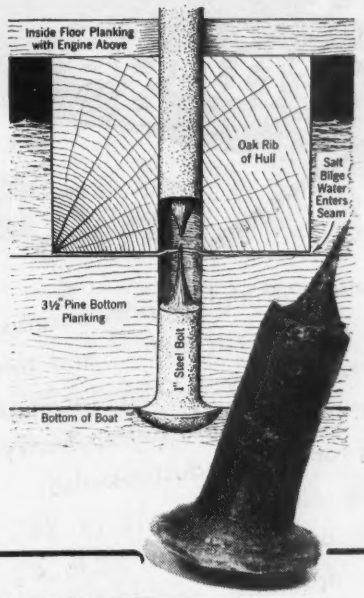
That concentration-cell corrosion "hides away" and is also fairly common may be judged by noting some of the conditions that favor it and where such attacks are likely to occur . . . cracks and crevices in welded seams; unsealed crevices of all types of lap joints; fissures in metal caused by forming operations; *under* and *around* various accumulations on metal surfaces . . . marine growths . . . silt, scum, and salt encrustations and deposits . . . scale in evaporator and condenser tubes; brine, acid or other chemical-solution soaked timbers around tie-rods, staybolts and similar metal members.

Other factors, such as wet packings in idle machinery, stagnant areas in tanks and pipes and many more conditions, far too numerous to list, also favor the action. Preventive measures usually become obvious when each case is examined from the standpoint of the principles of concentration-cell effect.

Our illustrated folder, "How to Recognize and Control Concentration-Cell Corrosion," tells how, why and where this corrosion action attacks so that practical control measures can be devised for practically any situation.

INCO's Technical Service, on request, is prepared to assist engineers further in solving or avoiding concentration-cell corrosion problems. As a first step in securing INCO's help in a specific case, write for a copy of the Corrosion Data Work Sheet.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.


Inside Floor Planking with Engine Above
Oak Rib of Hull
Salt Bilge Water Enters Seam
3½" Pine Bottom Planking
1" Steel Bolt
Bottom of Boat

Actual Example of Concentration-Cell Corrosion

The 1" steel bolt holding down the engine bed of a New York Harbor motor lighter looked like this sample after being in service only two years. See Note 9 below.

PRACTICES for PREVENTING CONCENTRATION-CELL CORROSION

1. In new equipment specify butt joints and emphasize the necessity for complete penetration of the weld metal to guard against even minute crevices.

2. Lap joints should be avoided wherever possible or thoroughly sealed with weld metal or solder. In place of metal, a suitable caulking compound may be used if crevices and voids under the compound can be avoided during application or can be quickly corrected if they appear during service.

3. Existing lap or spot welded joints, that show evidence of crevice corrosion, should be cleaned as well as possible and all channels for liquid penetration —rivet heads, overlaps, and all crevice-like areas—sealed with weld metal, solder or caulked.

4. In design of vessels avoid sharp corners, stagnant areas or other sites favorable to the accumulation of precipitates and other solids.

5. Institute a routine of frequent, thorough cleaning of all metal areas subject to accumulations of deposits, scale or "skins." In marine work this precaution applies to marine growths, silt, scum and salt encrustations and deposits.

6. In the design and operation of tubular heat exchangers, endeavor to provide for uniform flow of liquid with a minimum of turbulence and air entrainment.

7. Provide suitable strainers in heat exchanger cooling medium lines to prevent local obstructions within the tubes which may start deposit attacks, or result in turbulence and impingement.

8. Remove all wet packing materials (unless of the corrosion-inhibiting type) from any equipment scheduled for a long shut-down period since concentration conditions under packings may become similar to those under deposits.

9. Because soaked timbers in contact with metal surfaces — tie-rods, pipes, stay-bolts, and similar members — promote concentration-cell effects, keep tie-rods tight and promptly repair all leaks in wooden tanks, even those that might otherwise be considered trifling. When soaking of timbers cannot be prevented, fastenings of highly corrosion-resisting metals offer the best protection. Fastenings of less resistant metals may be somewhat protected by coating with a suitable paint before installation.

Want Cast Fittings *now?*

Government and high priority business obviously comes first. BUT... and this should interest many... Kuhns facilities and raw stocks on hand permit heavy production for other industries also.

Complete cast fittings, ¼ to 24". Fast service on stock items, ¼ to 4", for steam, drainage, sprinkler, etc. All fittings rust-resisting, of uniform smoothness and accuracy. Thoroughly inspected.

THE KUHNS BROS. CO., Dayton, Ohio

Combined marketing facilities on both "K" cast iron and M.I.F. malleables. Complete stocks of both at Dayton, Ohio, and Branford, Conn.

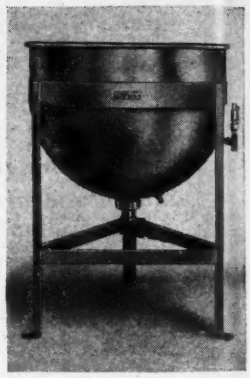
WRITE FOR KUHNS CATALOG TODAY

Combined marketing facilities on both "K" cast-iron fittings and M.I.F. malleables. Complete stocks at both Dayton, Ohio, and Branford, Conn.

On land...

on sea...

LEE



Wherever our American boys are fighting,—these dependable processing kettles are doing a swell job day in and day out—throughout the world. Stainless, corrosion resistant—easy to clean. Do you have the latest Lee catalog in your reference files?

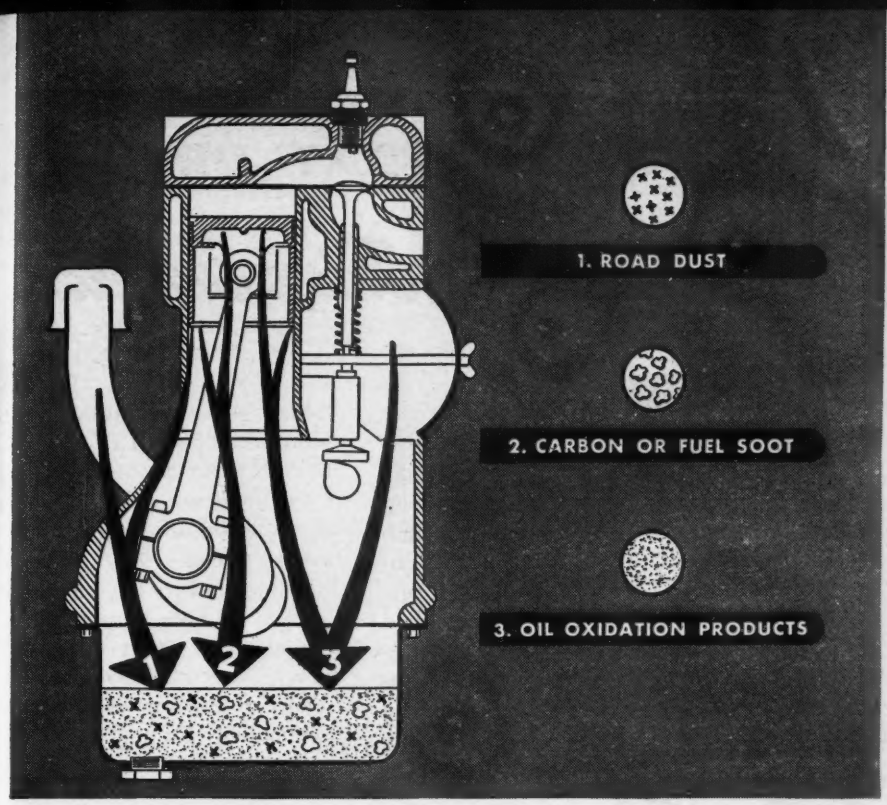
LEE METAL PRODUCTS CO., Inc.
416 Pine Street · Philipsburg, Penna.

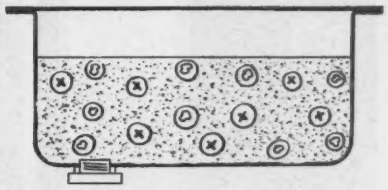
MIKRO

is the *PULVERIZER* also used for *GRANULATING* and *WET MILLING*

Versatile is the word for the Mikro! It processes hundreds of materials at lowest power cost—with unskilled labor. But the Mikro is also efficient—time saving—and cost saving when used for granulating and wet milling. Send for the Mikro-Pulverizer 32-page catalog. Or send samples of your material for a free laboratory test grind.

PULVERIZING MACHINERY COMPANY
97 Chatham Road Summit, N. J.





Effect of detergency. Detergency in motor oil eliminates deposits by preventing fine dust and carbon particles from settling out of the oil. In effect, the detergent surrounds the contaminants with a film which prevents them from adhering to each other and to metal parts of the engine. It holds them in suspension until they are removed by the filter or drained from the crankcase. But detergency alone does not protect against oil oxidation, which causes varnish, viscosity increase, and corrosion.

A timely development...*heat-proofing* helps keep heavy duty engines clean

● "HEAT-PROOFED" Stanolube H.D. is a war-born development. But it is not a war substitute—not a compromise to meet the shortage of critical materials. *It is* a brand new type of heat-fighting oil. A timely development made Stanolube H.D. available just when it was most needed to help keep heavy duty gasoline and automotive Diesel engines operating.

In fact, it is only because of the vital part that bus and truck fleets and construction equipment play in the war effort, that Stanolube H.D. is made available to you.

Take advantage of this opportunity to conserve your equipment. Read how Stanolube eliminates the cause of engine deposits at the source. Test Stanolube H.D. in your own equipment. Ask a Standard Oil Man to help you. Call any local Standard Oil Company (Indiana) office, or write 910 S. Michigan Ave., Chicago 5, Ill. In Nebraska, write Standard Oil Company of Nebraska, Omaha 2.

Detergency plus oxidation stability in Stanolube H.D.

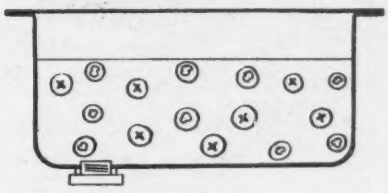
Oil contamination. Most troublesome engine deposits are caused by the gradual contamination of motor oils in use. The contaminants usually found in conventional oils are shown in the diagram above.

1. Road dust may enter the oil system through the crankcase breather or through the combustion chamber, past the pistons and into the crankcase.

2. Fuel soot or carbon caused by poor combustion may also blow by the rings and get into the oil.

3. Oil oxidation products are formed by excessive engine heat and agitation of the oil in the presence of oxygen. They take many forms. Some cause rapid increase in oil viscosity. Others, under certain conditions, cause corrosion. But by far the most prevalent and troublesome oil oxidation product is that causing a varnish or lacquer-like coating on pistons, rings, and valve stems. This type is not only troublesome itself, but it acts as a binder for dust and carbon particles, forming heavy deposits in ring grooves and crankcases, and on valve stems, rocker arms, oil screens and filters.

Note. Water is a contaminant frequently found in motor oil. It results from leakage or condensation, and produces water sludge. This type of deposit occurs frequently in cold-running engines such as in delivery trucks. It should not be confused with deposits caused by dirt or oil failure. It can be eliminated, not by changing the type of oil, but only by correcting the mechanical conditions causing it.



Detergency plus "heat-proofing." To eliminate all troublesome deposits, particularly those occurring under extremely heavy duty service in gasoline and automotive Diesel engines, a new type of motor oil was developed by Standard Oil. First, a petroleum stock was selected having great resistance to oxidation. Then, by solvent refining, the unstable hydrocarbons—those easily oxidized—were removed as completely as possible. Finally, the remainder was stabilized by the addition of a special oxidation-inhibitor and detergent developed in Standard Oil laboratories.

This oil—"heat-proofed" STANOLUBE H.D.—slows down the rate of oil oxidation to the minimum. The detergency becomes doubly effective in preventing the formation of deposits from other contaminants. The mild solvency or purging action of Stanolube H.D. gradually removes deposits formed prior to its use and has cleaned up many a dirty engine over a period of time.

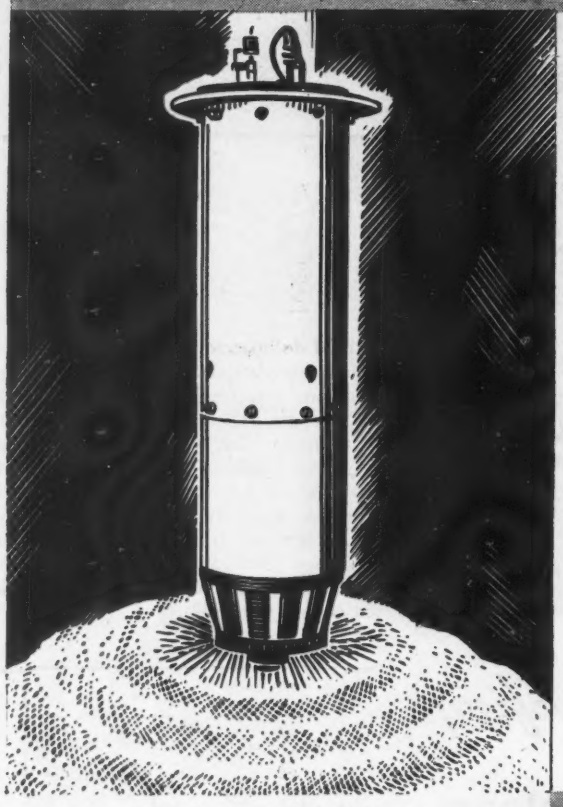
Oil is ammunition... Use it wisely

★ *heat-proofed* **Stanolube H.D.** ★

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ **FLEET CONSERVATION SERVICE**

ECONOMICAL AND EFFICIENT SPRAY-DRYING



Descriptive literature describing the BOWEN process in detail, will be sent promptly on request; write today.

Soups, Milk, Juices, Eggs, etc.

Widely used in the food, dairy and processing industries, the BOWEN process of spray-drying offers the efficient and economical solution to food drying problems. This remarkable process involves the reduction of fluid or semi-fluid substances to powder by instantaneously evaporating moisture from its atomized particles. Solubility is greatly increased, particle size is controlled, and the product rendered free-flowing.

BOWEN spray-drying equipment is designed and engineered to eliminate the use of critical materials in every way possible. The vital need for this advanced process in both essential and semi-essential fields — its efficiency, dependability and uniformity of product—attest to its practicability for your particular needs or complexities.

Bowen RESEARCH CORP.

34 MAPLE STREET BOWEN **GARWOOD, N. J.**

PIONEERS IN SPRAY-DRYING ENGINEERING AND DESIGN

LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of Food Industries, published monthly at Albany, N Y., for October 1, 1943.

State of New York }
County of New York } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared J. A. Gerardi, who, having been duly sworn according to law, deposes and says that he is the Secretary of the McGraw-Hill Publishing Company, Inc., publisher of Food Industries, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, McGraw-Hill Publishing Company, Inc., 330 West 42nd St., N. Y. C. 18, Editor, Laurence V. Burton, 330 West 42nd St., N Y C 18, Managing Editor, F. K. Lawler, 330 West 42nd St., N. Y. C. 18, Business Manager, None.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder, the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) McGraw-Hill Publishing Company, Inc., 330 West 42nd St., N. Y. C. Stockholders holding 1% or more of stock: James H. McGraw, 330 West 42nd St., N. Y. C. James H. McGraw, Jr., 330 West 42nd St., N. Y. C. James H. McGraw, James H. McGraw, Jr., and Curtis W. McGraw, Trustees for: Harold W. McGraw, James H. McGraw, Jr., Donald C. McGraw, Curtis W. McGraw, 330 West 42nd St., N. Y. C. Curtis W. McGraw, 330 West 42nd St., N. Y. C. Edwin S. Wilsey and Curtis W. McGraw, Madison, New Jersey, Trustees for James H. McGraw, 3rd., Curtis W. McGraw, 330 West 42nd St., N. Y. C. Donald C. McGraw, 330 West 42nd St., N. Y. C. Anne Hugus Britton, 330 West 42nd St., N. Y. C. Mildred W. McGraw, Madison, New Jersey. Grace W. Mehren, 73 No. Country Club Drive, Phoenix, Arizona. Wilson C. Laucks, 1501 Cleveland Avenue, Wyomissing, Pennsylvania.

3. That the known bondholders, mortgagees, and other security holders, owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is. (This information is required from daily publications only.)

J. A. GERARDI, Secretary.

McGRAW-HILL PUBLISHING COMPANY, INC.

Sworn to and subscribed before me this 29th day of September, 1943.

[SEAL] EMILY Z. SHEPARD.

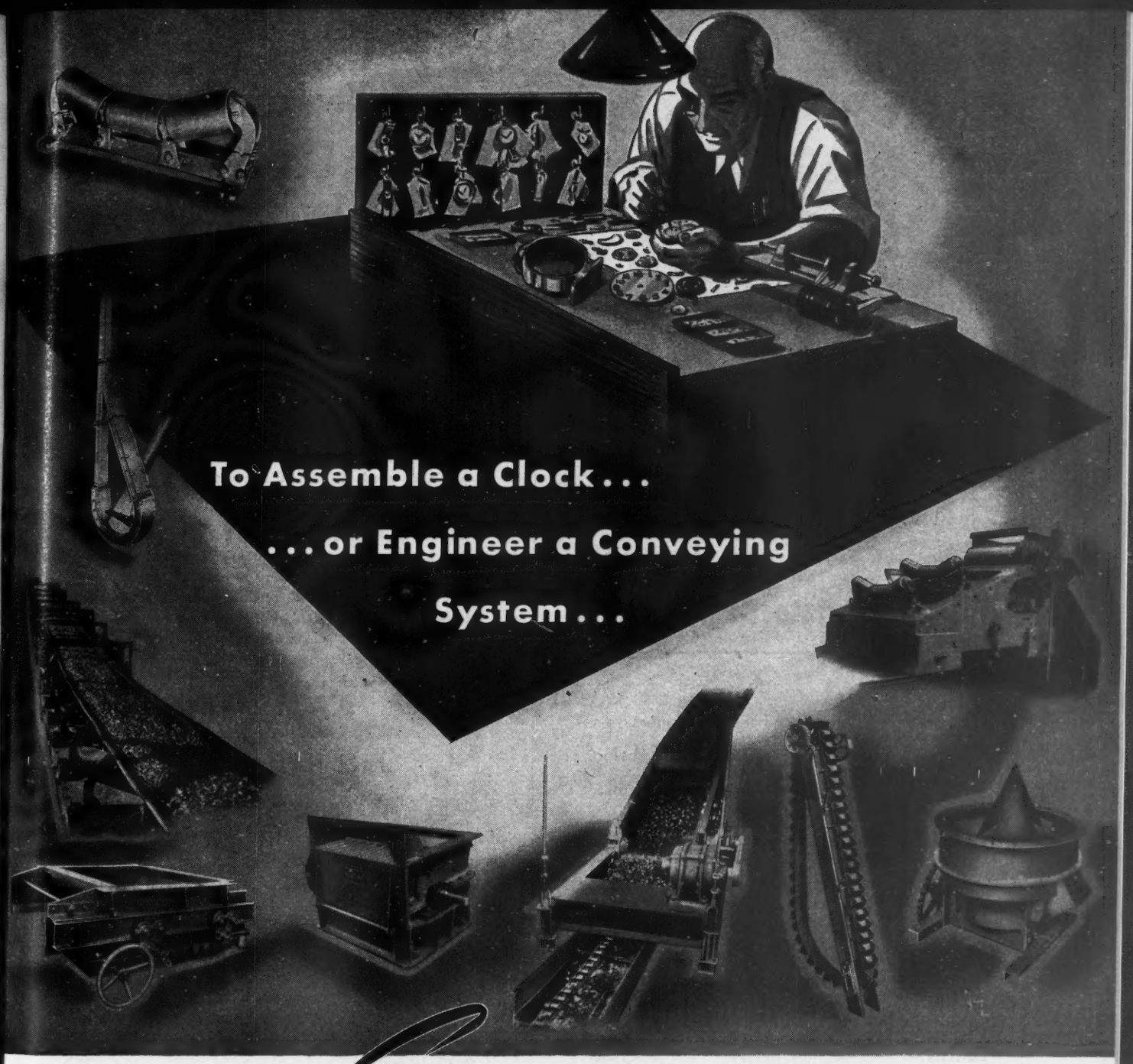
Notary Public, New York County. New York Clerk's No. 768, N. Y. Co. Reg. No. 481275.

(My commission expires March 30, 1944)

POST WAR DISTRIBUTION

Sales representation for Food Processing Equipment and supplies is a subject receiving increasing attention from manufacturers and producers. An increasing number of requests are being sent in to Food Industries ranging from salesmen, or manufacturer's representatives to supply houses. In an effort to gather together in one place a working list of such sales outlets, the publishers of Food Industries are starting an intensive search for all available names of individuals and organizations who might be interested.

Address your reply to—Publisher, Food Industries, 330 West 42nd St., New York 18, N. Y. Give all details possible, indicating present lines of Food Processing equipment or materials or supplies handled; additional lines desired; territory being covered plus such additional information as you may think interesting.



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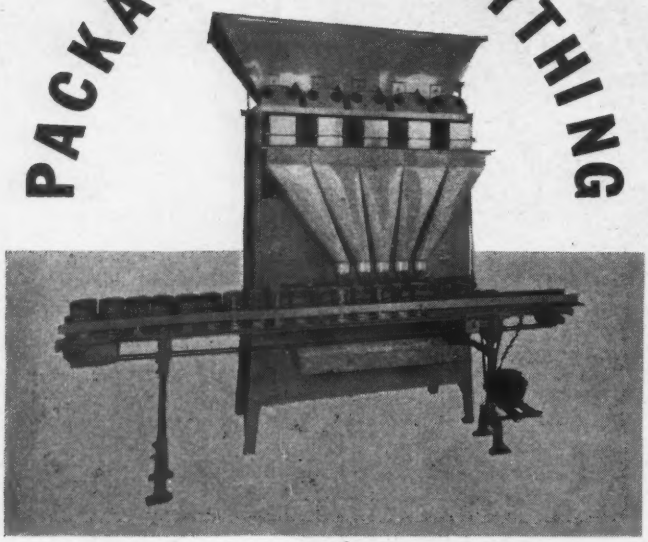

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Kettles, Containers of all sizes and shapes
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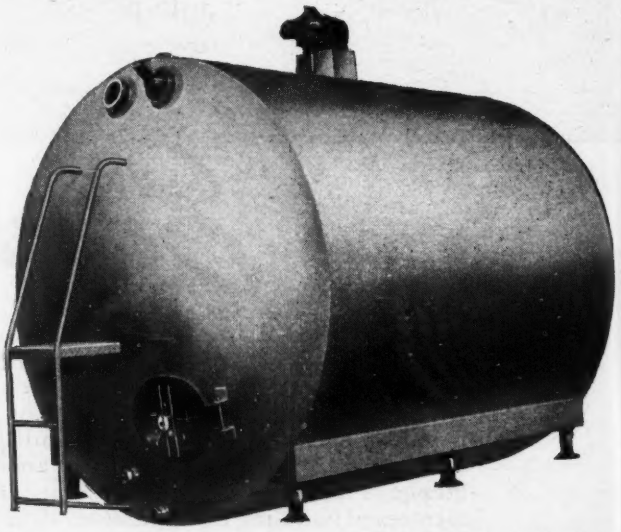

Damrow-Built Storage Tanks of Stainless Steel with Agitator.

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More than 30 single punch and rotary models of automatic compressing machines are available. Production rates up to several hundred tablets per minute. Special machines built to order.

Use the experience of our engineers and our well-equipped, semi-plant scale laboratory for the solution of your debulking or compressing problems.

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Engineers and Manufacturers of Equipment for Vacuum and Atmospheric Drying, Compressing and Debulking of Food Products

F.J.Stokes PROCESSING EQUIPMENT FJS Est. 1895

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INDIVIDUALIZED EQUIPMENT FOR EACH SPECIFIC JOB!

When the demands of wartime production tax your equipment to its limit, you'll find that KOVEN individualized equipment increases the efficiency of your plant. KOVEN equipment is designed to meet the specific needs of the job at hand. That's why, for years, leading food manufacturers have turned to KOVEN to design and fabricate equipment to meet their particular requirements economically and efficiently.

Our engineers will gladly consult with you about your equipment problems.

Among the many KOVEN products

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- Pails, Special Heavy
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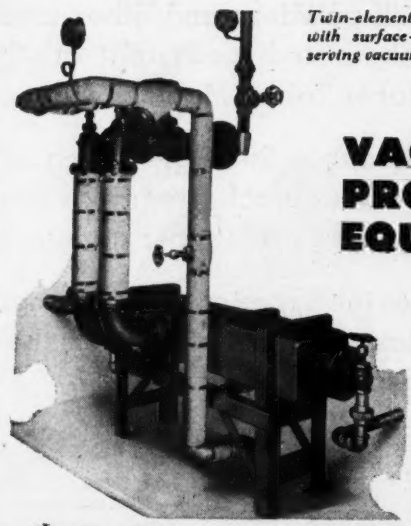

Twin-element, single-stage ejector with surface-type aftercondenser serving vacuum sealing machines.

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★ VACUUMS required in industrial processes are often most economically produced by means of steam-jet ejectors. They not only will handle dry air or gases, but also many mixtures containing sticky or solid materials such as chaff and dust. They can be made of suitable materials for handling high temperature or corrosive gases. Ejectors have no moving parts and they can be quickly and easily installed. Ingersoll-Rand manufactures a complete line of vacuum equipment for any capacity at pressures as low as 50 microns Hg. absolute. Other Ingersoll-Rand vacuum equipment includes surface and barometric condensers, reciprocating dry vacuum pumps and steam-jet refrigeration units.

4-287

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RUBBER *will help* WIN THE WAR

Get in the *Scrap* for Victory

Save TIN CANS *For* VICTORY

HOME HEALTH *will help* WIN THE WAR

U. S. Needs Us Strong *Eat Nutritional Foods*

Sponsor These War Campaigns as the Reverse Feature of 2-Sided

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Your colorful Meyercord Decal window sign, the reverse side of which thanks customers for their patronage as they leave your dealer's store, now provides a powerful medium for helping the national war effort.

National advertisers desirous of contributing to the nation's morale can sponsor any of these vital campaigns as the reverse or store-side feature of their decalcomania signs. Conventional advertising messages, trademark or product reproductions can appear on the front.

Dealers readily allot valuable space to such efforts. Any merchandising subject—any patriotic slogan, can be inexpensively reproduced in full color with Meyercord's durable, washable, easily applied 2-sided Decal window signs. Your inquiry is invited. Free designing service. Please address Department 6511.

50th Anniversary 1943

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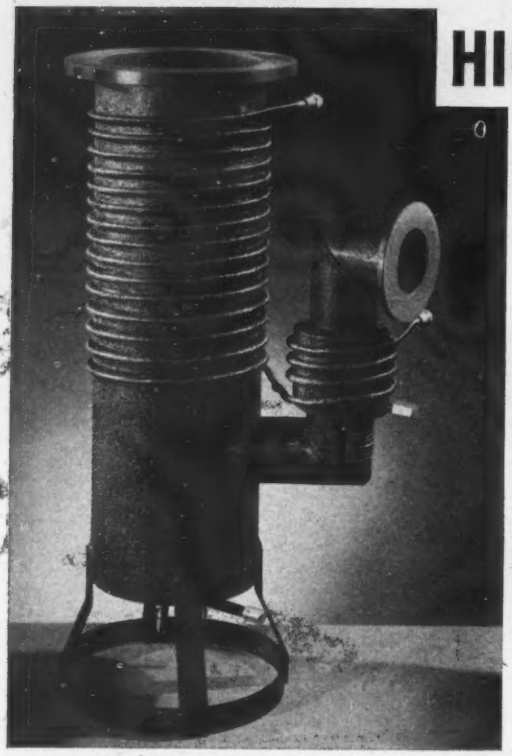

Metal Booster Pump, Type MB-200

HIGH-CAPACITY VACUUM PUMP

All-metal . . Booster Type

The new Distillation Products 2-stage *Metal Booster Pump, Type MB-200,* is specially designed for use with large forepumps having a low volumetric efficiency at pressures below .5 mm. It is durably constructed, its specifications being as follows:

SPEED	200 l/s. at 10^{-4} mm. and 10^{-3} mm.
ULTIMATE VACUUM	5×10^{-5} mm.
MAXIMUM FOREPRESSURE	.5 mm.
HEATER INPUT	700 watts
PUMPING FLUID	butyl sebacate
HEIGHT	24 in.
DIAMETER	6 in.

Further data about this new unit and its possible applications in specific situations will be forwarded upon request.

Inquiries are also invited for information regarding the 11 additional types of Distillation Products high-vacuum diffusion pumps, as well as low-vapor-pressure fluids, vacuum greases, vacuum gauges, and glass-fabrication service.

DP INC

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Jointly owned by EASTMAN KODAK COMPANY and GENERAL MILLS, INC.

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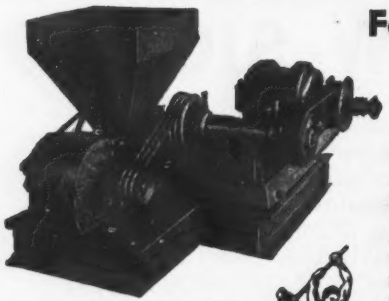

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"DUSTLESS OPERATION"

Requiring no auxiliary separators, fans or collection attachments. "Built in Many Sizes"

"Illustrated Bulletin on Request"

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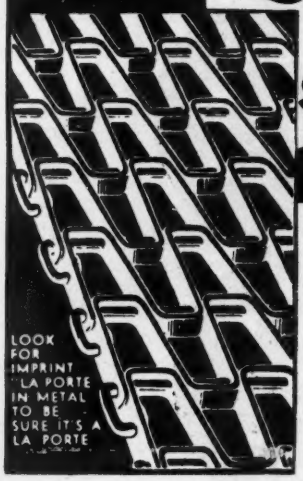
SAVES as it SERVES



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Will not creep, weave nor jump, is easily and quickly installed, and readily sterilized with a steam gun or scalding water. The open mesh feature permits the circulation of air around products in process.

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More batches per day FROM THESE PFAUDLER STAINLESS STEEL KETTLES

Faster heating and mixing . . . easier cleaning

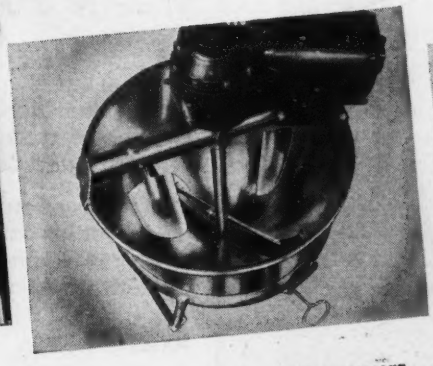
IN designing these standard stainless steel cooking kettles, Pfaudler has applied the same "know how" that has solved many design problems in the chemical, refining and process industries. As a result, you get more batches per day through more efficient heat transfer and mixing action.

Steam is quickly distributed by means of a special (patented) steam nozzle; agitation, varying from mild mixing to violent surface disturbance can be accomplished with motor driven stainless steel agitator alone or in combination with two adjustable baffles. Interior and exterior of these kettles are streamlined for easy cleaning.

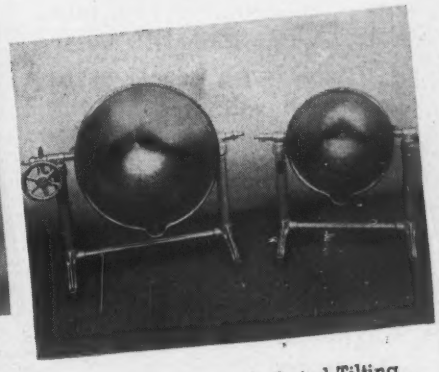
Capacities range from 30 to 300 gallons and all kettles are fabricated to provide either 60 or 100 P.S.I. jacket pressure. Equipped with Pfaudler designed outlet flush valve with lever extended to side so that operator can open or close without danger of being burned. Truss legs provide sturdy support.

These kettles and other Pfaudler food equipment are fully described in Bulletin 819, yours for the asking. Use the mailing form below.

Precision Built Kettles used in making soup concentrates



Anchor Type Agitator with scrapers and adjustable baffles



Unjacketed or ⅔ Jacketed Tilting Kettles have 6-inch pouring lip

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Finer grinding, homogenization, emulsification
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PREMIER COLLOID MILLS

which process liquids, solids or pastes—dispersing the elements of the food completely — reducing them to micron sizes unobtainable with other equipment. Mills available with capacities to 1,200 gallons or 10,000 pounds per hour depending on food to be processed. Submit *your* product to our laboratories for test.

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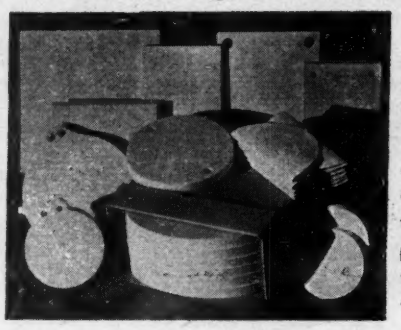
Everything for FILTERING!



You may be pleasantly surprised to learn how much our experts know about your problems. They can recommend the correct material for filtering every food product—and show you how to save time and cut costs!

WRITE FOR FREE SAMPLES of "Germ-proof" Asbestos Pads, Filter Felts, Filter Papers, Filter Cloth and Filtermasse. Immediate delivery. Also full line of equipment, including filters, tanks, pumps and FILCO Easy-Ride Conveyors.

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330 West 42 Street New York 18, N. Y.

TIME TO CROW

...when we're in Tokio!

Feeling cocky about the war?
Better not . . . you can't crow
without sticking your neck out!

• • •

Sure, there have been . . . and there will be . . . successes along the road to Victory. But these must not make any of us over-confident.

Rome. Even Berlin! Just milestones on the long, hard road to Tokio. With a fanatical foe contesting every inch of the way!

Only a tidal wave of men, materiel and money will engulf Japan!

To help swell this wave, American industry must have . . . at once: WOMEN . . . by the many thousands to take the places of men gone to war.

Even more important . . . EFFORT to the point of sacrifice on the part of every man and woman in industry . . . workers and bosses.

Another must . . . DOLLARS! . . . Investing in War Bonds is a further opportunity to show our enemies what their fate shall be.

• • •

Crow? Sure! But only in Tokio!

Carrier Syracuse, N. Y.

Makers of Air Conditioning and Refrigeration Equipment

• *This message in poster form for use on factory bulletin boards is available upon request.*

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- **canning and packaging equipment maintenance and construction**
- **equipment purchasing**
- **high pressure boiler equipment**
- **air conditioning**
- **building maintenance and construction**

We are willing to pay this man what he is worth. Write, giving full particulars regarding education, experience, salary expected to

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Persons now in war work will not be considered.

POSITIONS VACANT

SUPERINTENDENT: Well established food plant affords excellent opportunities for aggressive man with knowledge of fruit packing. Permanent position, excellent salary. State age, draft status, experience in detail first letter. P-187, Food Industries, 330 W. 42nd St., New York 18, N. Y.

MAINTENANCE FOREMAN: With detailed experience on fruit canning equipment. Eastern Food manufacturer offers permanent position with wonderful salary opportunities. In first letter give age, list of previous employers, draft status. P-188, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FROZEN FOODS ENGINEER: Graduate in chemistry or mechanics, familiar with refrigeration machinery, is offered exceptional opportunity in postwar development with large food manufacturer whose labels are world-famous. Experience in preparing, processing and freezing foods desirable. Write today. P-214, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

CHEMIST—Draft deferred, thoroughly capable in food processing and manufacture of flavors and extracts. Permanent in essential industry. Give full particulars of background, education, degrees held, salary desired, nationality, etc. in first letter. All information confidential. Location Philadelphia. P-215, Food Industries, 330 W. 42nd St., New York 18, N. Y.

PICKLE MAN WANTED—To take complete charge small plant packing quality merchandise. Must be thoroughly experienced all phases brining and processing to finished product. Good position with excellent future. Goodman Bros., 24 Miller St., Meriden, Conn.

FOREMAN WANTED for Preserve, Marmalade and Jelly in a small plant. Should have general knowledge of preserves, fruit juices, canning equipment and related processes. Permanent year round position with an opportunity to live in God's country. State age and past experience fully together with salary required. Address: Seminole Fruit & Preserving Company, P. O. Box 1, Little River, Miami, Fla.

CHEMIST ASSISTANT WANTED: Large food plant. State age, experience, and salary. Statement of availability required. P-221, Food Industries, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

FOOD TECHNOLOGIST: Broad experience in production, research, development, control work, including packaging and dehydrating. Graduate chemist. Have been employed as Plant Manager, Chief Chemist, Research Chemist. Employed in non-essential industry. Not subject to draft. Good references as to character and ability. PW-216, Food Industries, 330 W. 42nd St., New York 18, N. Y.

MERCHANDISER AND SALESMANAGER—Over fifteen years experience with outstanding record of achievement merchandising through food trade. Wide national acquaintance with wholesale and chain buyers. Desirous of joining forward looking organization who is preparing for post war business. Qualified in all phases of selling. Capable advertising ability—all consumer mediums including radio; copy, layouts, production. Intensive worker and profit producer. PW-217, Food Industries, 330 W. 42nd St., New York 18, N. Y.

FOOD TECHNOLOGIST — Diversified background production, control and development. Graduate training in chemistry and bacteriology. Young, draft deferred. Looking for an opportunity for creative work in the food industry. New York or Eastern United States preferred. PW-218, Food Industries, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

PRODUCTION CHEMIST, 25 years experience in Manufacture, Food Products, Flavors, Aromas, Supplies, Specialties for bakers, Bottlers, Dairies, Confectioners, Candy Makers, Hotels, Institutions, Analyse, Match, Improve, Create. New items, desires executive position in or around New York City. PW-219, Food Industries, 330 W. 42nd St., New York 18, N. Y.

THOROUGH KNOWLEDGE manufacture of genuine and artificial flavoring extracts, aromas, fruit juices, stabilizers; bakers' confectioners' soda fountain and institutional supplies and specialties. Can match, improve and work up new items, instruct salesman. Location immaterial. PW-220, Food Industries, 330 W 42nd St., New York 18, N. Y.

SALES MANAGER: 22 years experience food processing and sales. Technical graduate. Able organizer, familiar all territories. Handle national accounts personally. Age 44. Salary $6000. PW-225, Food Industries, 330 W. 42nd St., New York 18, N. Y.

WANTED

WOODEN BOXMAKING MACHINERY wanted: Nailing Machines, Boxboard matchers, printers, etc. J. Wolfson, 810 Keystone Building, Pittsburgh, 22, Penna.

FOR SALE

FOR SALE—2—170 ton vilter ammonia compressors, horizontal twin units direct connected to 250 H. P. 4600 volts, 3 ph. 60 cy. 109 R.M. synchronous motor. One Motor Generator set 150 Amp. 120 volts, D. C. with 1200 G. P. M. pump both direct connected to 60 HP 220 volt motor. FS-222, Food Industries, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE—One 36-inch diameter stainless steel vacuum pan, with mild steel condenser. Less than one year old. Krim-Ko Company, 4830 S. Christiana Ave., Chicago 32, Ill.

PACIFIC NORTHWEST

Well established soft drink manufacturing and distributing concern with own fleet covering Inland Empire seeks sole distribution for substantial food manufacturer of any kind. Plenty warehousing and/or manufacturing space.

Write in detail to

RINEHART BEVERAGES
226 Madison **Spokane, Wn.**

FOODS

With a view to post-war development large English firm of Food manufacturers with surplus capital and manufacturing facilities available is desirous of entering into negotiations with American firm. Would be prepared to purchase outright suitable Trade Mark or Patent, or enter into manufacturing arrangements on royalty basis. Have connections throughout Great Britain with Grocers, Bakers and allied trades. Replies treated strictly confidential.

Box 200 C/o T. B. Browne, Ltd.
551 Fifth Avenue **New York City**

FOR SALE
DEHYDRATING PLANT

Completely equipped. Located in North Jersey, heart of potato area. Two acres land. Building 200 x 75 feet. Railroad siding. Capacity 35,000 lbs. raw material in 8 hours. Drying tunnel 90% automatic. Single or double stage with finishing bins. Deep-well water. Will also consider partner.

BO-210, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

(Additional Equipment Wanted Ads on Page 196)

WANTED

3—Good used horizontal semi-dry powder mixers, 2-60 gal, 1-600 gal.

1—Good used horizontal dry powder mixer cap. 60 gal.

1—Good used vibrating gyratory sifter #100 mesh screen, cap. 1000 lbs./hr.

1—Good used Brush Type Sifter #80, Mesh Screen, cap. 1500 lbs./h.r

1—Good used Rotary Vacuum Dryer 3' x 15' with condenser, dust filter, receiver and pump complete.

W-212, Food Industries
330 West 42nd Street, New York 18, N. Y.

WRAPPING MACHINES WANTED

Package Model C for wrapping 5¢ chocolate bars.

Reply to W-224, Food Industries
330 W. 42nd St., New York 18, N. Y.

WANTED

2—Tablet Machines: 3—Filters.

2—Dry Powder Mixers, with or without Sifters.

2—Rotex Screens; 1—Packaging Machine; 1—Glass Lined Kettle; Stainless Steel, Monel, Copper or Aluminum Jacketed Kettle and Vacuum Pan.

W-132, Food Industries, 330 W. 42nd St., N. Y. C.

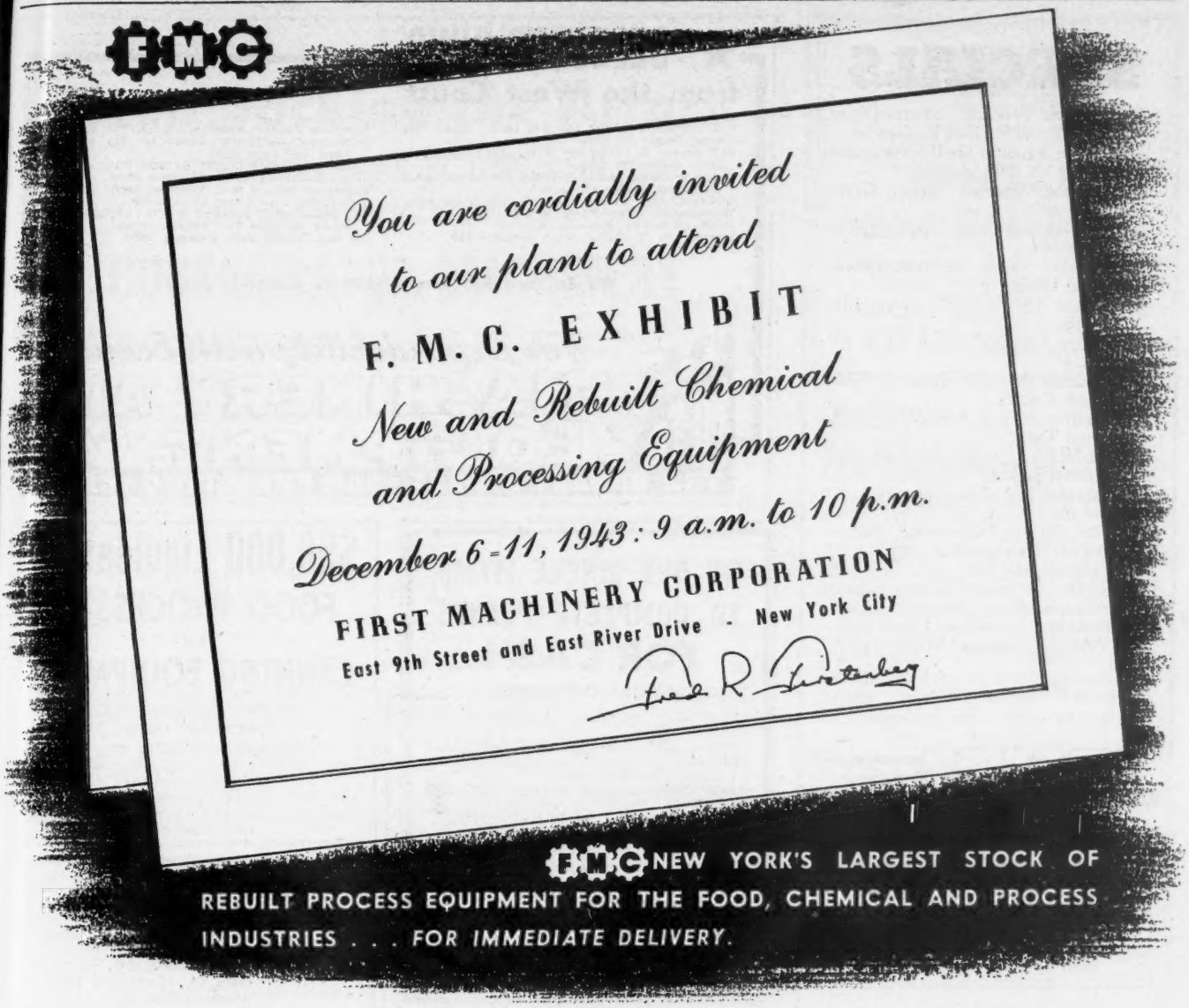
WANTED
FOOD PRODUCTS

We will buy available dehydrated vegetables, meat and milk products and concentrated fruit juices. Edible government rejects wanted. State quantity and price.

International Foodcraft Corp.
63 Whipple St. **Brooklyn 6, N. Y.**

WANTED
STOKES & SMITH
TRANSWRAP MACHINE
Model B Auger Feed

W-211, Food Industries
330 West 42nd St., New York 18, N. Y.


F M C
You are cordially invited
to our plant to attend
F. M. C. EXHIBIT
New and Rebuilt Chemical
and Processing Equipment
December 6-11, 1943: 9 a.m. to 10 p.m.
FIRST MACHINERY CORPORATION
East 9th Street and East River Drive - New York City
Fred R. Firstenberg

F M C NEW YORK'S LARGEST STOCK OF REBUILT PROCESS EQUIPMENT FOR THE FOOD, CHEMICAL AND PROCESS INDUSTRIES . . . *FOR IMMEDIATE DELIVERY.*

HYDRAULIC PRESSES
HYDRAULIC LIFTS, TRUCKS
KETTLES—Aluminum
Copper, Glass Lined
Iron, Cast Iron
Monel, Nickel
Stainless, Sheet Steel

LABELERS
MIXERS (Dry)
Powder, Semi-Liquid
Heavy Duty Paste
Jacketed

Packaging Equipment

PANS—Evaporating
Coating, Vacuum

PERCOLATORS
PORTABLE MIXERS
PRESSES—Hydraulic
Tablet, Toggle
PUMPS—Gear
Rotary, Vacuum
Centrifugal
RETORTS—Pasteurizers
SIFTERS & Mixers
STILLS
TANKS

AGITATORS
BLOWERS
BOTTLES & JAR
Cleaners, Rinsers
Sterilizers

CAPPERS
CAN CLOSERS & SEAMERS
COLLOID MILLS
CONVEYORS
COOKERS
CRUSHERS
CRYSTALLIZERS
CUTTERS

DICERS
DISINTEGRATORS
DRYERS
DEHYDRATING EQUIPMENT
EMULSIFIER
EVAPORATORS
EXTRACTORS
FILLING EQUIPMENT
Liquid, Semi-Liquid
Paste, Dry Materials

FILTERS
FOOD CHOPPERS & GRINDERS
HOMOGENIZERS

FIRST to *"really rebuild"* EQUIPMENT to FUNCTION *good as new!*

Call GRamercy 7-6620
Cab service provided
to our plant

F M C FIRST MACHINERY CORP.
EAST 9TH STREET & EAST RIVER DRIVE, NEW YORK

SPECIALS

1—Buflovak Vacuum Shelf Dryer, with 12—42" x 42" shelves
1—Devine Vacuum Shelf Dryer, with 13—59" x 78" shelves
1—Buflovak Vacuum Drum Dryer, 24" x 20"
1—Buflovak Double Drum Dryer, 32" x 90"
1—Buflovak 5' x 6' Atmospheric Drum Dryer
1—Devine 4'3" x 19'8" Steam Tube Dryer
2—Rotary Vacuum Dryer, 2½' x 10', 3' x 8'
2—Pfaudler 300 gal. Jacketed Glass Lined Kettles
1—Pfaudler 4' x 4' Open Top Glass Lined Tank
1—Pfaudler 125 gal. Vacuum Pan, without Jacket
3—Sharples No. 6 Centrifuges
1—Shriver 30" x 30" Filter Press, with Shriver Diaphragm Pump
1—Copper Vacuum Pan, 30"
10—Centrifugals, 32", 40", 48", 60"
1—Kiefer 18 spout Rotary Vacuum Filler, with s.s. fittings
2—Buffalo Can Fillers, ½ to 5 gal.
7—Vibrating Screens, Rotex, Tyler

Complete stocks of Pulverizers, Mixers, Conveyors, Pumps, Filters, Tanks, Kettles, etc. Send for bulletins.

BRILL Equipment Co.
183 VARICK STREET NEW YORK

Zone 14

1—Cast Iron Jacketed Glass-Lined Kettle, with Agitator, 250-gals.

5—Johnson Melting Kettles, Agitated, 40-gals.
7—Steel Jacketed Kettles, Agitated, 1500-gals.
10—Earthenware Tanks, 5-gals. to 30-gals.
1—Hurrell Homogenizer, Type 14, 30 HP Motor.
2—Premier Colloid Mills, 5", liquid-type.
3—Charlotte #50 Colloid Mills, 20 HP Motors.
1—Kenyoun-Francis Jacketed Steriliser, 6' x 10'.
1—Pneumatic Weigher & Packer, for 50# bags.
2—Smidth Iron-Lined Tube Mills, 4' x 12'.
2—Aluminum Condensers, 36" dia., 6'10" high, no tubes.
1—American 3-Leaf Filter, wooden leaves.
3—INFILCO Stainless Steel & Monel Disc Filters, #1, #0, #5.
2—FEINC Wooden Continuous Filters, 4'x10': 8'8"x8'.
3—Johnson Hydraulic Filter Presses, 18", 7 Plates.
1—Meakim Continuous Expeller.
2—Steel Autoclaves, Agitated, 1000-gals.
2—Devine Jacketed Autoclaves, 3'x4'.
1—Valley Iron Works Autoclave, 60-gals.
1—Bartlett & Snow Rotary Brick-Lined Dryer, 8½'x50'.
1—Louisville Rotary Steam Tube Dryer, 6'x50'.
1—Allbright-Nell Single Drum Dryer, 4'x9'.
6—Schultz-O'Neill Pulverizers, 16". 20".
1—Allis-Chalmers 2-Roll Crusher, 10" x 24".
1—Copper Jacketed Kettle, 2750-gals.

Also: Steel Tanks, Pumps, Extractors, Boilers, Pipes, Valves, Fittings, etc.

R. GELB & SONS, Inc.
Est. 1886
Union, N. J. UNionville 2-4900
(Send for "Gelb News Record").

Davidson Wet Vacuum Pump 3½ x 4 x 4.
Several used Copper Steam Jacketed Kettles.
3 HP Elec. Motor D.C. 575 rpm perfect.
One 10 HP Kane gas fired steam boiler almost new.

THOMAS BURKHARD, Inc.
494-496 Flushing Ave., Brooklyn, N. Y.

★ SELECTED BUYS
from the West Coast

A-B Cooker & Cooler for #10 cans, Cooker 400 cans, Cooler 100 cans.
A-B Cooker & Cooler for #2½ cans, Cooker 832 cans, Cooler 260 cans.
Berger & Carter Cooker & Cooler for #2½, Cooker 1008 cans. Cooler 280 cans.
6—Draper type conveyors, 6"-24" wide, 6'-20' long.
Worthington Steam Pump 10 x 6 x 10.
Merry-Go-Round Conveyor, 50 pans.
Sterling W. T. Boiler, High Pressure 320
American Peeling Machine, 75 lbs. per batch.
2—Hoepner Automatic Scales for dry products, auger and scale types.
2—100 gal. Krenz Copper Vacuum Pans.
Charlotte Colloid Mills, Stainless Steel.
Eppenbach Colloid Mill, Stainless Steel, 3 HP.
U.S. Piston Type Filler, for jam, etc.
100 Gal. Copper Jacketed Kettle, upright.
7 Copper Jacketed Tilt Kettles, 10 Gal.
Jay Bee Cracker Jack Hammer Mill.

★ ★

We Buy and Sell Single Items to complete Plants

★ ★

For Dependability with Economy
MELO MACHINERY AND EQUIPMENT CO.
732 BRYANT STREET • SAN FRANCISCO • CALIF.

WE BUY SINGLE ITEMS TO COMPLETE PLANTS FOR CASH

SPECIAL OFFERINGS!

BUFFALO 24" x 20" Vacuum Drum Dryer
PFAUDLER Jacketed Kettle, 500 gals.
OLIVER 3' x 2' Continuous Filter, stainless steel parts.
Four Jacketed Steel Kettles, 200 and 225 gal.
KIEFER VISCO and BERLIN CHAPMAN Liquid Fillers.
COGSWELL 24" Attrition Mill.

Numerous others in stock send for Bulletin "M".

MACHINERY & EQUIPMENT CORPORATION (of N. Y.)
59 E. 4th St. New York 3, N. Y.

$50,000 Liquidation!
FOOD PROCESSING AND CANNING EQUIPMENT

Ask for complete list of over 400 items.

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1188 Harrison St., San Francisco 3, Cal.
Tel.: UNderhill 5571

D. B. LEWIS CO.
3402 Avalon Blvd. Los Angeles 11, Cal.
Tel.: ADams 3303

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15 ton 22'x9' Bonded Motor Truck Scale...$440.00
20 ton 24'x10' Bonded Motor Truck Scale... 575.00
30 ton 34'x10' Bonded Motor Truck Scale..1040.00
3'x6' Bonded Vibrating Screen—Single Deck 495.00
3'x8' Bonded Vibrating Screen—Two Deck.. 685.00

All new—immediate delivery. Also guaranteed used equipment without priority.

BONDED SCALE CO.
2176 S. Third St., Columbus, Ohio
Attention: Dept. FI

TANKS from Tank Cars

Large quantity

8,000-gallon 10,000-gallon
Built for 60# Hydrostatic and 25# Air Tests.
CLEANED—TESTED—PAINTED

Special Notice: **What would *PORTABLE* storage of your Liquids save you? Ask our proposition on *WHOLE CARS!***

Also TANKS, Commercial, Vertical and Horizontal

From 2879 to 12,500 gals. and even much larger.

IRON & STEEL PRODUCTS, INC.
38 years' experience
13426A S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

MILLER WRAPPING AND SEALING MACHINE

Having changed our method of operation offer at reasonable price this fine machine, Model MPPT17. From sheets wraps and heat seals 1200 packages per hour. Chromium Finish, Fine Condition.

HOTEL BAR BUTTER CO.
365 Greenwich St. New York

WANTED

WANTED TO BUY

Spray dryer using steam heat. Must be in good condition. Quote price and give complete details as to type, make, capacity, etc., in first reply.

W-223, Food Industries
520 N. Michigan Ave., Chicago 11, Ill.

RECONDITIONED
Styl-O-Matic Straightline Unscrambling Tables

One right hand and one left hand, with revised double V-belt discharge. Immediate delivery.

This is an opportunity to obtain one of the famous Styl-O-Matics at a reduced price.

ISLAND EQUIPMENT CORP.
101 Park Ave. New York, 17, N. Y.

WANTED

1—20 H.P. Almond Right Angle Drive
1—10 or 12 foot Section roller inspection table
1—Rotary Tomato Washer capable of handling 10 or 15 tons of tomatoes per hour.
1—Tomato Juice Filler for 46 oz. cans, and #2 or #10.
1—Tomato Cooker and Cooler for #2 cans capable of holding approx. 1500 cans.
1—Tomato Cooker and Cooler for 46 oz. cans capable of holding 800 cans.
1—Tomato Cooker and Cooler for #10 cans capable of holding 300 to 400 cans.
1—Two row #2 can electric boxer.
1—#2 can unscrambler.
1—Crate Dump—Standard Knapp.
1—Automatic case sealer with compression belt.
2—#10 tomato cooker.
1—Haynie Tomato scalder.
1—Air compression approx. 7x8 with motor.

S. E. W. FRIEL
Queenstown, Maryland Phones 2111-2121

Keep Backing the Attack

INVEST IN WAR BONDS AND
SPEED PRODUCTION WITH

CONSOLIDATED MACHINERY

1—National Package Machine, semi-auto. Filling Machine with top and bottom sealer and wrapper.
1—Pneumatic Scale Packaging Unit.
10—Pony Mixers 8 to 80 gal. capacity.
15—Dry Powder Mixers, from 50 to 4000 lbs.
13—Edbauer, Scott, U. S. auto. Weighers and Fillers.
1—24" x 30" Vertical Retort.
2—80-qt. Century 4-speed Mixers, m.d.
2—Horizontal Steam Jacketed Mixers, 1100 gal. each.
14—Double and Single arm Mixers, jacketed and unjacketed, up to 500 gal. cap.
1—32"x72" Buffalo Atmospheric double drum Dryer, complete, m.d.
1—C.C. & S. 7-head Jumbo Model "B" Crowner, m.d.
1—Pneumatic Scale 6-head auto. Screw Capper and Feeder, complete, m.d.
2—Buffalo 24" Vanilla Bean Choppers.
4—World, 1—Ermold semi-auto. Labeling Machines.
1—Burt Straight Line Duplex Labeler.
2—Karl Kiefer Visco Filling Machines.
1—Karl Kiefer 18-spout Rotary Vacuum Filler.
1—#7 Sweetland filter, 27 copper leaves, 3" o.c.
6—Filter Press P & F; Recessed; to 42" Square.
1—Pneumatic Scale Slip On Can Capping Machine, complete with conveyors, m.d.
2—World Rotary Automatic Labeling Machines.
2—Aluminum Jack, Agit. Stills, 275 gal. and 350 gal.
8—DeLaval and Sharples Super Centrifuges.
2—Mechanical 4x9' Lard Rolls, m.d.
17—Copper, Glass Lined, Kettles and Vacuum Pans, up to 550 gal. capacity.
4—#432 Rotex Sifters, triple deck 40"x84", complete, m.d.
2—Schutz-O'Neil Pulverizers.
3—K.K. & U.S. Rotary bottle Rinsers, m.d.
1—5x35' Louisville Steam Tube Dryer.
1—Elgin 12-spout Rotary Piston Filler, S.S.
12—Copper Tanks to 7000 gal.
1—Johnson T & B Sealer Unit.
2—2"x2" Bronze Rotary Pumps, m.d.
1—U.S. Brightwood Box Machine.

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Office: 13-17 PARK ROW, N. Y. Shops: 335 DOREMUS AVE., NEWARK

Buy With Confidence — "Consolidated"

UNION
Rebuilt Machinery
Established 1912

Rebuilt Guaranteed Machinery

SPECIAL
Just Received

1—Pneumatic Scale 20 spout vacuum type filling machines.

1—Johnson Automatic lining and setting up machine, top sealer and interconnecting conveyor

In Stock . . . Ready For Immediate Delivery

ALL OFFERING SUBJECT PRIOR SALE!

Wire Collect For Prices & Details!

Pneumatic Scale Co. Top Sealer and Wax Liner.

48" Copper Vacuum Pan, jacketed, complete with condenser, vacuum pump, etc., also 20 to 300 gal. sizes.

World Semi-Automatic Bottle and Jar Labeler.

Ermold Bottle Labeling Machines, motor driven.

Werner & Pfleiderer, 2,500 gal., double arm jacketed Storage and Mixing Tanks.

U. S. Bottlers 10 spout Model C-10 Filling Machine, 4 to 16 oz. cap.

850 gal. capacity Steam Jacketed Single Action Vertical Mixing Tank.

PACKAGING AND CARTONING EQUIPMENT

Including cartoning units, filling and wrapping machines—all types, makes and sizes in stock.

We Pay Cash For Single Machines Or Entire Plants

EVERY MACHINE REBUILT TO UNION'S STANDARD OF PERFECTION

UNION STANDARD EQUIPMENT CO.

318-22 LAFAYETTE STREET
NEW YORK, N. Y.

1—28' Meyer brass chain bottle conveyor, complete with ½ H.P. 3-phase motor and 90 degree corner bracket.

1—Belt conveyor 16" wide, 20 degree MD booster 10' elevation.

1—Belt conveyor 24" wide by 100' long double deck M.D.

1—Bar-type 60 degree MD case booster, 15' elevation.

1—Gravity conveyor, 2000', 12", 14", 16", 20", 24" and 28".

1—Chain case conveyor 80' with three 90 degree curves M.D.

1—20 tube 12' Wright insulated and porcelain jacketed internal tube cooler, 14—1½" nickel tubes on water, 6—1½" stainless steel tubes on ammonia, plus extra 4 tube stainless steel ammonia section.

10—Motor-driven Alvey-Ferguson 12" wide belt conveyors, ranging from 50 to 200 ft. long each.

Many other conveyor items.

Above equipment attractively priced for quick disposal to make room for expanded new conveyor manufacturing facilities.

ISLAND EQUIPMENT CORP.
101 Park Ave. . . . New York, 17, N. Y.

FOR SALE

5—Pneumatic Scales Duplex Automatic Straight Line Labelers
9—World Labelers semi-automatic-World-Ermold-O&J
3—New 60 gal. Stainless Steel tanks with covers
2—New 500 gal. Stainless Steel tanks
6—Kiefer, Goldman, and U. S. Rotary Bottle Rinsers
5—Copper Spray Drying Towers 8' 6" dia. x 32' high
1—Creamery Pkg. Mfg. Stainless Steel, 100 gal. Pasteurizer rectangular; 45 x 20 x 32, with Stainless Steel Agitator
20—Centrifugal Pumps—Stainless Steel, Bronze & Iron
60—Wood Storage & Fermenting Tanks 130-8600 gals.
20—Steel Welded & Sectional Storage Tanks 3000-18,000 gal., with legs and manholes
9—J. H. Day Horizontal Mixers and Sifters
40—Copper Tanks 50-700 gal. capacity
40—100 gal. Galvanized Spice Hoppers on casters with Discharge Valves.
Also Bucket Elevators, Spiral Screw Conveyor, Pot Stills, Condensers, Columns.

Write for latest stock list

PERRY EQUIPMENT & SUPPLY CO.
1515 W. Thompson Street Phila., Pa.

FOR SALE

60 gal. Pfaudler Tank, jkt., rev. coil.
2—100 gal. Glascote Tanks, jkt., agit.
5—100 gal. Pfaudler Tanks, jkt., agit.
303 gal. Nickel Tanks, 36"x60"x36", insul.
300 gal. S. S. Tank, jkt., agit.
300 gal. Pfaudler Tanks, horiz., 42x48, insul.
850 gal. Pfaudler Tank, jkt., agit.
25 gal. Copper Kettle, jkt., agit.
70 gal. Copper Still with coil, 26"x36".
1½ bbl. Dough Mixer, 3 H.P.
80 qt. Hobart Mixer, 2 H.P.
J. H. Day Post Mixers, S. S. paddles.
100 lb. Day Sifter and Mixer.
2" Dayton Dowd Centrif. Pump, 10 H.P.
60 to 400 gal. Homogenizers or Viscolizers.
12 ft. Multiple Tube Heater or Cooler, 8 p.h. with 32 1" white metal tubes.

Send Us Your Inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
MUrray Hill 2-4615

FOR SALE

Triangle Model "U" Bag Filler.
Hayssen Cellophane Box Wrapper.
Schutz O'Neill Dustless Sugar Pulverizer No. 3, No. 0 and 16" Limited.
24" Pebble Mill, belt drive.
1 ton York, 1 ton Lipman 3 ton Frick, 5 ton Jurick and 7½ ton Lipman Self-contained Refrigeration Units.
Steam Jacketed Copper Kettles, 15 gallon to 350 gallon capacity.
Dean Glucose Pump Steam Drives.
Tabor 3" Glucose Pump, motor drives.
Read 80 qt., Hobart 80 qt., Century 30 qt., and Read 12 qt. Vertical Mixers.

SAVAGE BROS. CO.
2638-46 Gladys Avenue Chicago

FOR SALE

3—Lard Rolls, 3x6, 4x9 and 2x5'.
2—4x6' Atmospheric Drum Dryers.
2—Vacuum Drum Dryers, 48x40 & 40x60".
6—#600 DeLaval Clarifiers.
1—World automatic rotary Labeler.
6—World & National semi-auto. Labelers.
2—Rotary Bottle Rinsing Machines.
2—M&S Universal Filling Machines.
1—#6 style B Peerless rotary Exhauster.
1—24" Attrition Mill with 20 hp. motors.
2—Water Stills—5 and 10 GPH.
2—Colloid Mills requiring 40 hp. each.
Dough and Powder Mixers, Bottle and Can Fillers, Filters, Filter Presses, Mills, Dryers, Pumps, Boilers.

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.

LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave. Chicago 22, Ill.

SPARKLER
HORIZONTAL PLATE
FILTERS

Sparkler filters purify, clarify and revitalize all liquid food products to perfection either on original manufacture, or for re-use. With the present scarcity of shortenings and oils, the value of Sparkler filtration is enhanced as a war conservation measure.

We will analyze your filtration problems and make recommendations on the equipment best suited for your product. Write for this free engineering service—no obligation.

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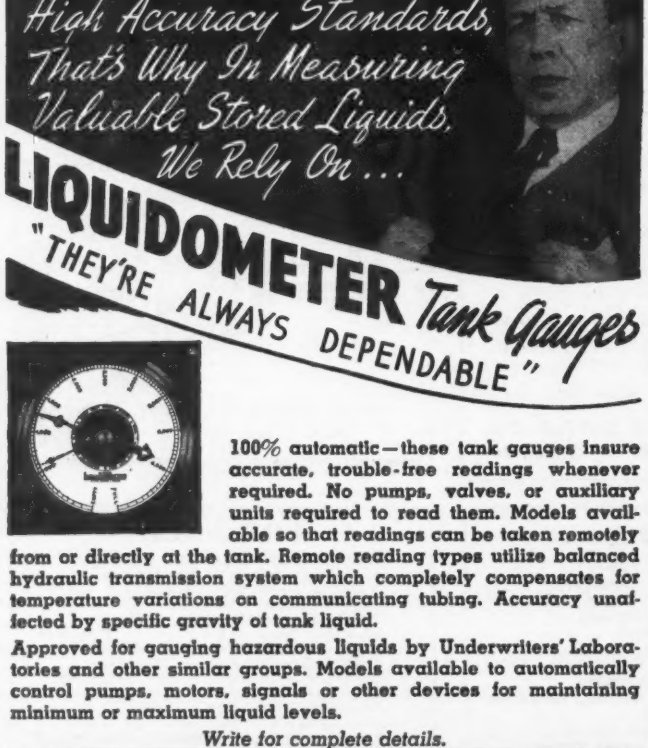
276 Lake Street — MUNDELEIN, ILL.

50 to 10,000 G.P.H.


My Business Maintains High Accuracy Standards, That's Why In Measuring Valuable Stored Liquids, We Rely On...
LIQUIDOMETER Tank Gauges
"THEY'RE ALWAYS DEPENDABLE"

100% automatic—these tank gauges insure accurate, trouble-free readings whenever required. No pumps, valves, or auxiliary units required to read them. Models available so that readings can be taken remotely from or directly at the tank. Remote reading types utilize balanced hydraulic transmission system which completely compensates for temperature variations on communicating tubing. Accuracy unaffected by specific gravity of tank liquid.

Approved for gauging hazardous liquids by Underwriters' Laboratories and other similar groups. Models available to automatically control pumps, motors, signals or other devices for maintaining minimum or maximum liquid levels.

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ADVERTISERS

	PAGE
Allis Co., Louis	37-38
• Allis-Chalmers Mfg. Co.	10, 43, 53
American Can Co.	54
American Coolair Corp.	114
American Monorail Co.	131
• Anchor Hocking Glass Corp.	51
Armstrong Cork Co.	101, 102, 133
Audubon Wire Cloth Co. Inc.	115
Baker-Raulang Co.	143
Bangor & Aroostook R.R.	122-123
Barnstead Still & Sterilizer Co. Inc.	109
Bemis Bros. Bag Co.	14
Bonded Scale Co.	196
• Bowen Research Corp.	134
Brill Equipment Co.	196
Bristol Co.	40-41
• Brown Instrument Co.	166
Buell Engineering Co.	171
• Buffalo Forge Co.	176
Bump Pump Co.	108
Burkhard, Inc., Thos.	196
Calcium Chloride Assn.	45
Carpenter Steel Co.	46
Carrier Corp.	193
Century Electric Co.	21
Chemical Industries, 19th Exposition of	113
Chevrolet Motor Div., General Motors Corp.	26
Clarke & Co., John	112
Cleaver-Brooks Co.	13
Consolidated Products Co. Inc.	197
Consolidated Siphon Supply Co. Inc.	173
Continental Can Co.	167
Cork Import Corp.	89
• Corn Products Sales Co.	161
• Corning Glass Works	179
Creamery Package Mfg. Co.	23
Crocker-Wheeler Electric Mfg. Co.	27
Crown Can Company	104
Cuno Engineering Corp.	169
• Cyclone Fence Co.	163
Damrow Bros. Co.	186
Darnell Corp., Ltd.	148
Dewey & Almy Chemical Co.	152
Diamond Crystal Salt Co.	138
Distillation Products, Inc.	157, 190
• Diversey Corp., The	141
• Dobeckmun Co., Inc.	11
• Dodge & Olcott Co.	163
Dow Chemical	52
du Pont de Nemours & Co., Inc., E. I. (Cellophane Div.)	82
• Economic Machinery Co.	127
Edge Moor Iron Works, Inc.	151
Electro Metallurgical Co.	22
Eppenbach, Inc.	136
Exact Weight Scale Co.	93
• Fairbanks, Morse & Co.	124
Ferry Co., J. D.	126
Filter Paper Co.	192
Filtrine Mfg. Co.	162
First Machinery Corp.	195
• Florasynth Laboratories, Inc.	163
Food Industries Catalog & Directory	81
Food Research Laboratories, Inc.	150
Foxboro Co.	44
Frederick Iron & Steel Co.	110
Friel, S. E. W.	196
Frick Co.	96
Gardner-Denver Co.	4
• Gardner-Richardson Co.	Third Cover
Gelb & Son, Inc., R.	196
General Electronic Industries, Div. of Auto-Ordnance Corp.	Second Cover
• General Electric Co.	16, 17, 50
General Motors Truck Co.	20
Gruendler Crusher Co.	190
• Gump Co., B. F.	118
Hersey Mfg. Co.	36
Hinde & Dauch	134
• Hoffmann-La Roche, Inc.	146
Horne-Ash Machy Co., Inc.	196
Hotel Bar Butter Co.	196
Hottmann Machine Co.	164-165
• Howes Co., Inc., S.	199
Hunter Machine Co., James	18
• Ingersoll Rand Co.	188
Inland Steel Container Co.	174
International Food Craft	194
International Nickel Co.	181
Iron & Steel Products, Inc.	196
Island Equipment Corp.	196, 197
• Jeffrey Mfg. Co.	173
Jenkins Bros.	15
• Kalamazoo Vegetable Parchment Co.	39
• Keasbey & Mattison, Inc.	42
Kehoe Machinery Corp., Lester	197
Kinetic Chemicals, Inc.	86
• Koven & Bros. Inc., L. O.	188
Kuhns Bros. Co.	182
Lamson Corp.	140
LaPorte Mat & Mfg. Co.	190
• Lee Metal Products Co., Inc.	182
• Leeds & Northrup Co.	32
Lincoln Engineering Co.	170
• Link-Belt Co.	7, 24
Liquidometer Corp.	198
Loeb Equipment Supply Co.	197
Machinery & Equipment Corp. (New York City)	196
Machinery & Equipment Co. (San Francisco)	196
Mack Mfg. Co.	12
• Magnus, Mabee & Reynard, Inc.	154
Maine, State of	122, 123
Master Electric Co.	31

IN THIS ISSUE

	PAGE
Mazzola, L. Charles	162
•Mears-Kane-Ofeldt, Inc.	114
Menasha Products Co.	89
Mercer-Robinson Co.	110
•Merck & Co., Inc.	160
Mercoid Corp.	173
Meyercord Co.	189
•Mixing Equipment Co., Inc.	8
•Monsanto Chemical Co.	117
•Mundet Cork Corp.	111
•Nash Engineering Co.	78
•National Can Corp.	48-49
National Cold Storage Co., Inc.	162
National Starch Products, Inc.	156
•National Technical Laboratories	130
Niagara Blower Company	91
•Nutritional Research Associates, Inc.	162
•Oakite Products, Inc.	149
•Orr & Sembower, Inc.	178
•Package Machinery Co.	107
Paterson Parchment Paper Co.	128
Peery Equipment & Suppy Co.	197
•Pfaudler Co.	191
•Pfizer & Co., Inc., Chas.	158
Philadelphia Quartz Co.	118
Pittsburgh Lectrodryer Corp.	200
•Pomona Pump Co. (Div., Joshua Hendy Iron Wks.)	29
•Powers Regulator Co.	98, 162
•Premier Mill Corp.	192
•Pulverizing Machinery Co.	182
Quaker City Cold Storage Co.	162
Quimby Pump Co., (Div. H. K. Porter Co., Inc.)	150
Reynolds Metals Co., Inc.	19
Rhinelander Paper Co.	35
•Riegel Paper Corp.	28
Rinehart Beverages	194
Ross & Rowe, Inc.	144
•Rossotti Lithographing Co.	97
Ryerson & Son, J. T.	199
St. Regis Paper Co.	33
•Sarco Company	25
Savage Bros. Co.	197
Schwarz Laboratories, Inc.	162
Seedburo Equipment Co.	99
Sethness Products Co.	162
Snell, Inc., Foster D.	162
•Sparkler Mfg. Co.	198
Spencer Lens Co.	178
Sprout, Waldron & Co.	175
Standard Conveyor Corp.	119
Standard Oil Co. (Indiana)	183
Stein, Hall & Co., Inc.	162
•Stephens-Adamson Mfg. Co.	185
•Stokes Machine Co., F. J.	187
Stokes & Smith Co.	170
Sutton, Steele & Steele, Inc.	112
•Swenson Evaporator Co., Div. of Whiting Corp.	5
Taylor Instrument Cos.	177
Texas Co.	Back Cover
Timken Roller Bearing Co.	6
•Toledo Scale Co.	95
Towmotor Co.	132
Trailer Co. of America, The	168
•Triangle Package Machinery Co.	186
•Tri-Clover Machinery Co.	142
Twitchell, Inc., E. W.	103
Union Carbide & Carbon Corp.	22
Union Iron Works	139
Union Standard Equipment Co.	197
•Universal Cooler Corp.	85
Van Heeden, Arthur	162
Victor Chemical Works	155
Viking Pump Co.	144
Vilter Mfg. Co.	145
Viobin Corp.	162
Walworth Co.	172
Wiley & Sons, Inc., J.	188
•Winthrop Chemical Co.	159
•Worthington Pump & Machinery Corp.	34
Wright's Automatic Machinery Co.	47
Wyandotte Chemicals Corp.	137
•Yarnall-Waring Co.	9, 142
York Corp.	30

• For further detailed information regarding this company's products see the 1943

FOOD INDUSTRIES
CATALOGS & DIRECTORY

Materials for the Food Manufacturer—162

•

PROFESSIONAL SERVICES—162

•

STORAGE, Frozen Foods—162

•

WHERE TO BUY—162

•

SEARCHLIGHT SECTION
Classified Advertising

BUSINESS OPPORTUNITIES	194
EMPLOYMENT	194
USED EQUIPMENT	194-197
WANTED TO PURCHASE	194-196

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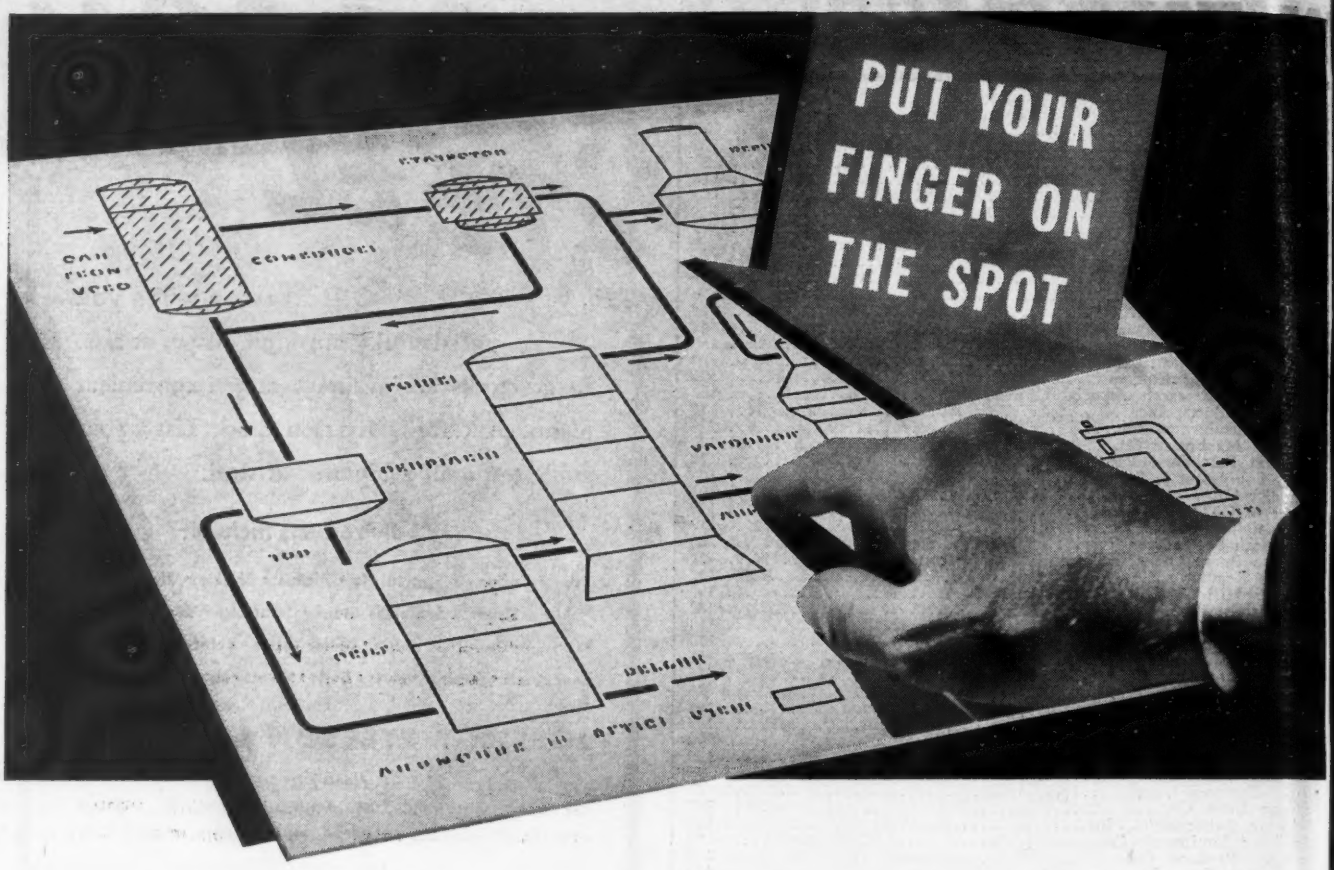

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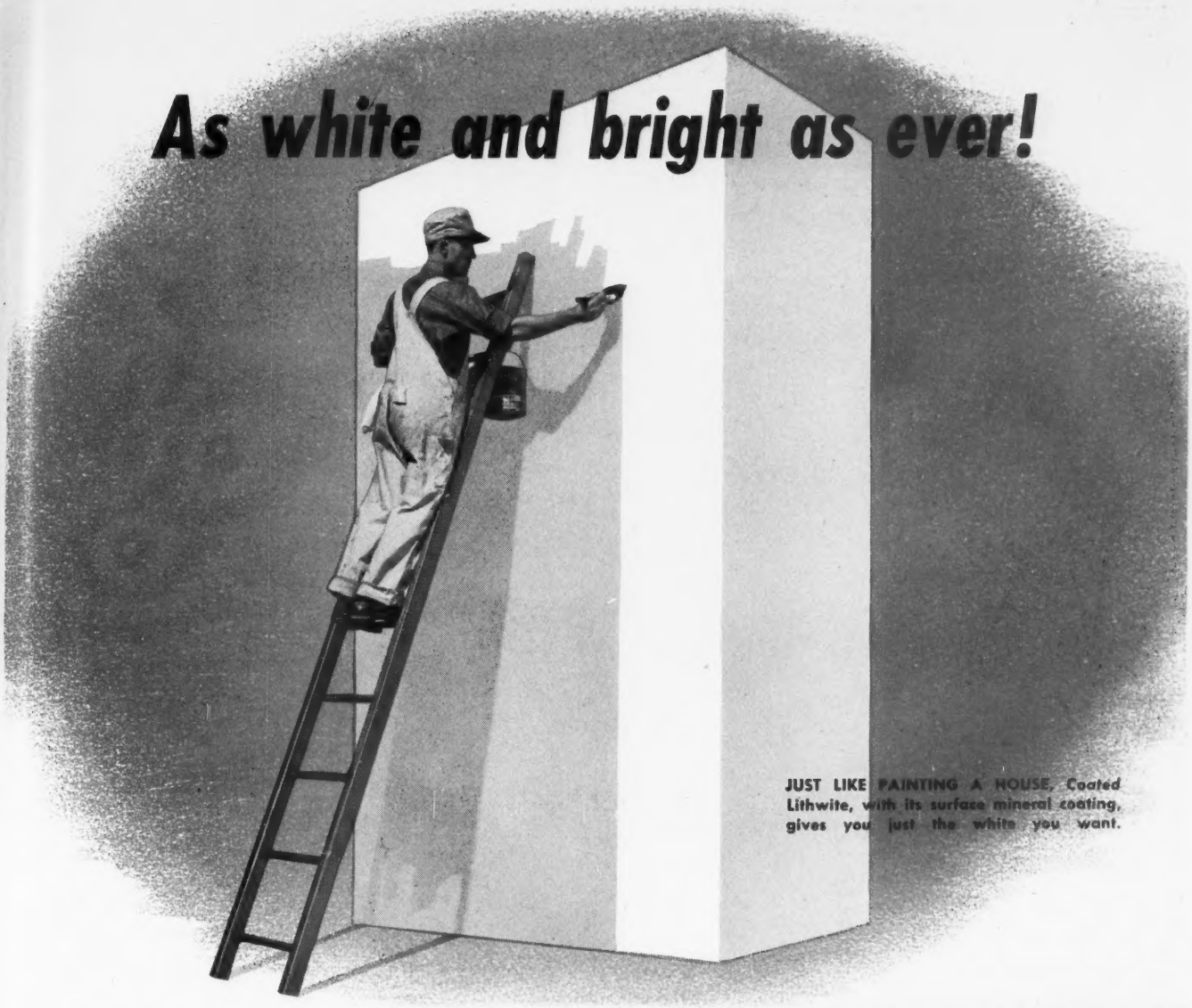

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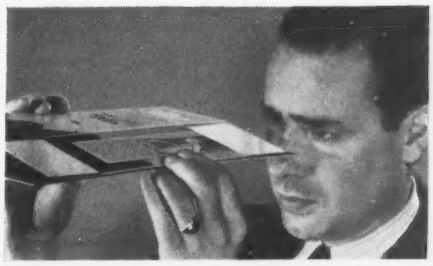

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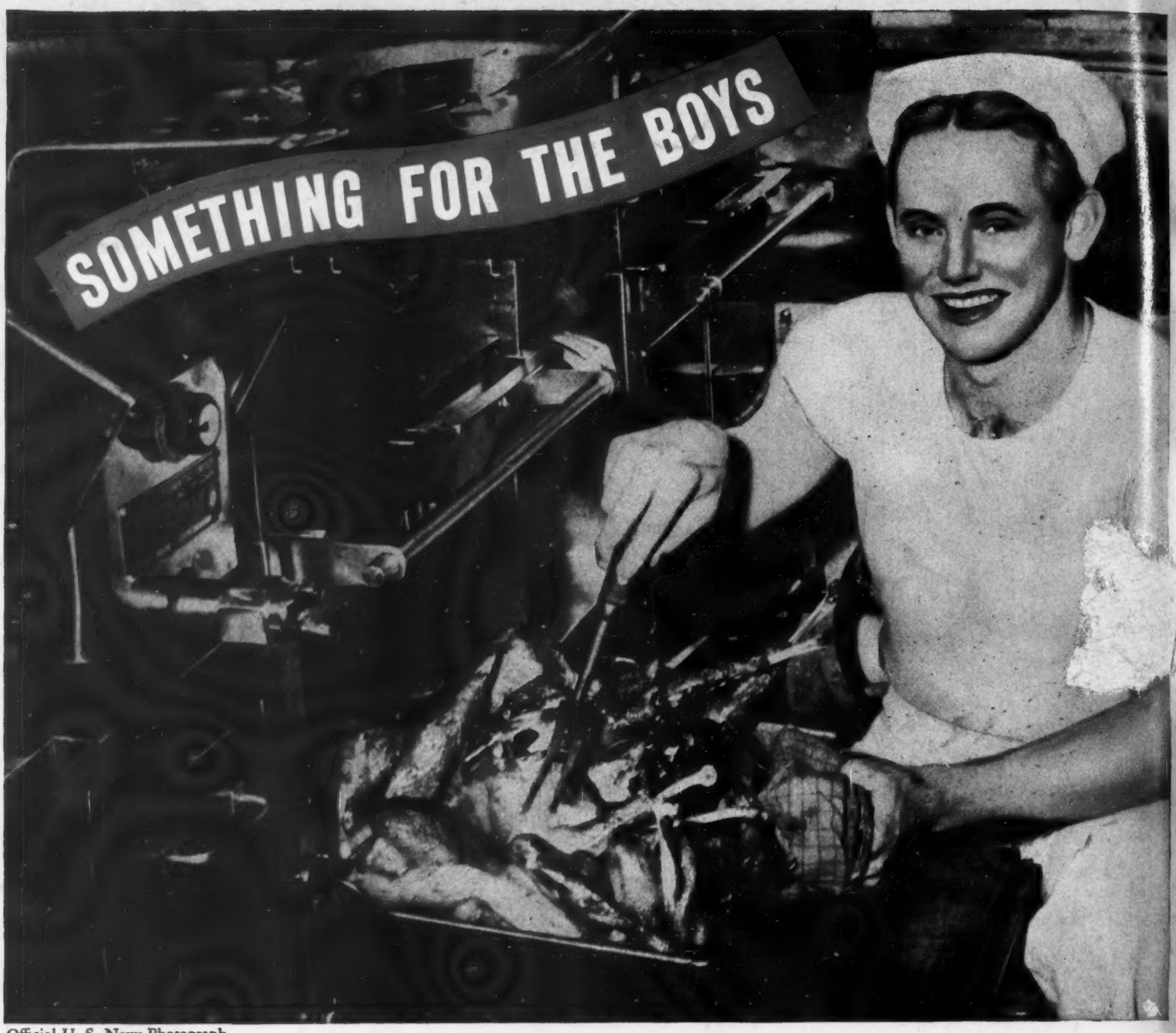

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